



Mobility Assessment and Bottleneck Changes, 2008 vs. 2005

Traffic Quality on the Metro-Atlanta State Highway System

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**Prepared for the
Georgia Department of Transportation
by Skycomp, Inc, Columbia, Maryland**



***Abbreviation in title:** “2008” used in reference to survey periods refers to the findings of the 2007 / 2008 survey iteration; in the same context, “2005” refers to the findings of the 2004 / 2005 survey iteration.*

***Abstract:** This publication summarizes the location and extent of daily recurring congestion on the state highway system in the 22-county metro-Atlanta planning region, as measured during morning and evening aerial photo-surveys conducted in late 2007 and early 2008. It also presents the locations where the most significant changes were recorded on the system between that period and 2004/05 .*

***Disclaimer:** The contents of this publication reflect the views of the authors, who are responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Georgia Department of Transportation or the Federal Highway Administration. This publication does not constitute a standard, specification or regulation.*



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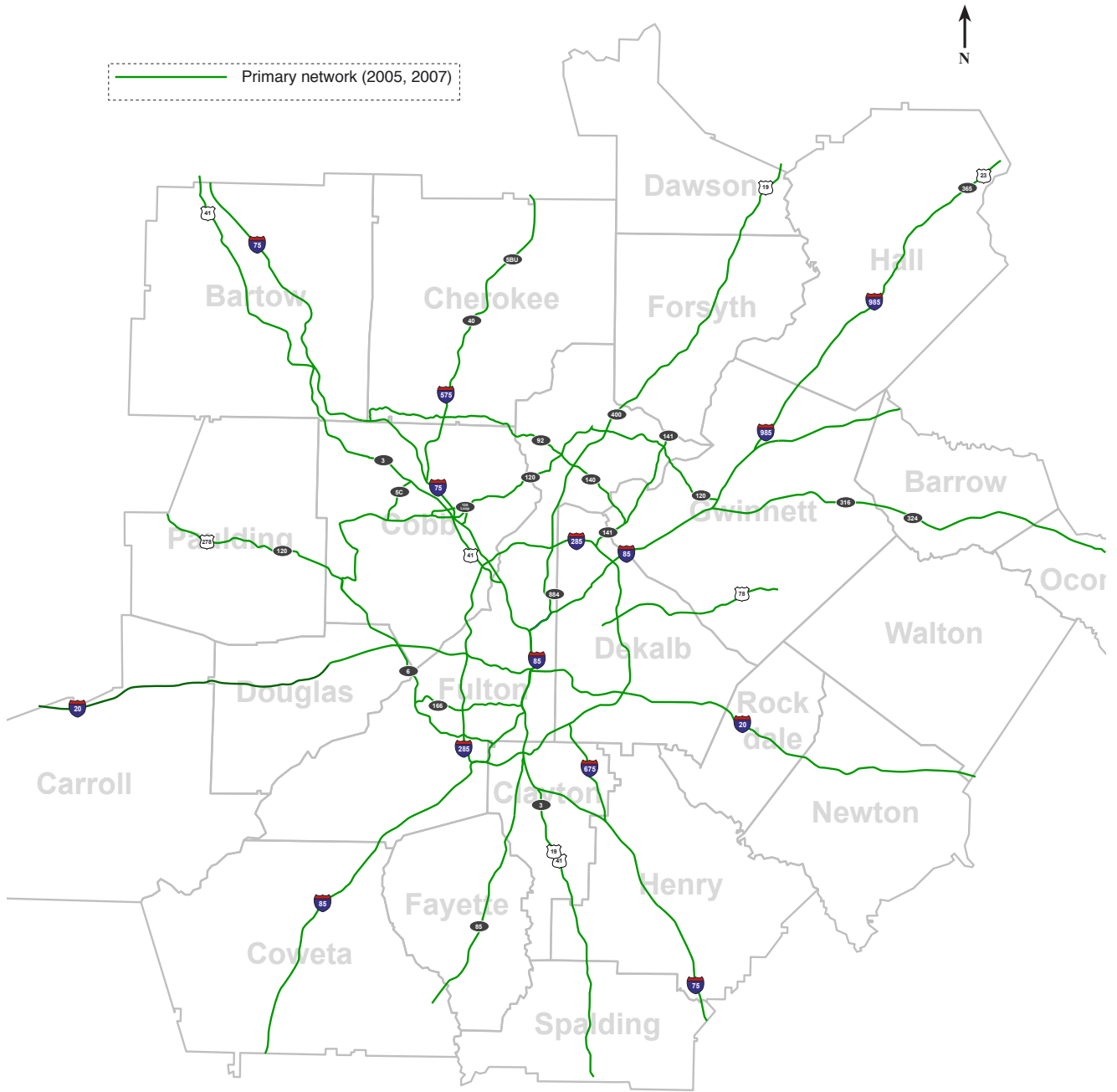
Photos

(Opposite) Congestion in Henry County at the southern terminus of I-675 at I-75, at 5:03 p.m. on November 1, 2007

(Front cover) Southbound congestion in Gwinnett County on I-85 at Old Norcross Road, at 7:14 a.m. on November 6, 2007. The view is looking north along the construction zone, with the interchange at SR 316 visible near the top.

(Back cover) Northbound congestion in Gwinnett County on I-85 at Steve Reynolds Blvd, at 5:48 p.m. on October 25, 2007.

FALL 2007 SURVEY: EXTENDED PRIMARY NETWORK



(Above) This map shows the original “primary” network of highways that was surveyed in 1998 and 2001, and then extended to the outlying counties in 2002. Altogether, this “extended primary network” covered all of the regional freeways as well as some of the key arterial highways. It was next surveyed in its entirety in 2005, and then again in the fall of 2007.

In 2004, a second, larger network was defined, the “regional arterial network”, comprised of the key signalized arterial state routes not already part of the primary network. This network, surveyed again in 2008, is shown on page 3 (colored red).



Introduction

This publication summarizes the state of mobility and congestion on the 2,000 mile highway network serving the Atlanta urbanized planning region, based on surveys conducted during 2007 and 2008 peak commute periods. This report also compares those findings to 2004 / 2005 survey findings, acquired of the same highways using the same methodologies. These pages will show that, while congestion throughout the system for the most part measured at levels close to those previously measured, improved mobility ratings were recorded for a number of highway segments and corridors. In many cases, these improvements resulted directly from recently completed capacity- and efficiency-enhancement projects. As expected, many segments were also identified with degraded traffic mobility.

Background

In 1998 the *Georgia Department of Transportation* (GDOT) initiated a program to monitor the quality of highway traffic flow across the 22-county Atlanta urbanized state highway network, through the use of time-lapse photography acquired from fast-moving aircraft. Aerial photography is well-suited for this purpose because it permits the comparison of mobility and congestion levels across a large highway network using one uniform set of analytical procedures. The photography also reveals insights about the underlying causes of congested bottlenecks, useful for analysis or to help decision-makers better understand technical recommendations. Information is produced through this program to support the long-range planning process, by providing a clear understanding of current conditions and trends from which realistic projections can be made. This program also provides a means to evaluate the effectiveness of specific completed projects, where those investments were intended to maintain or restore highway mobility.

Aerial survey operations have been repeated every 2-4 years since 1998, with new highway sets added for coverage in 2002 and 2004. Each iteration has generally taken about two months to complete, with 4 to 8 aircraft typically working at a time. Flights have been conducted during peak morning and evening commute periods (6:30 to 9:30 a.m. and 4:00 to 7:00 p.m.), and repeated until 24 samples of each covered highway have been acquired. After the effects of confirmed or suspected incidents have been excluded, traffic flow has been rated from the photography by hour, segment and direction. Performance rating database tables were then assembled; these tables indicate where highway usage was light, moderate, or heavy, and identify the location, extent, severity, and duration of congestion.

The database now contains mobility performance ratings in the Atlanta urbanized region across an 11-year period. Methods have been developed to store survey data and images to facilitate fast and easy retrieval. Through the GDOT website, users can download the entire series of reports, extract performance rating tables from the underlying database, generate customized comparison graphics, and view interactive maps that are annotated with red or orange bottleneck arrows. These arrows depict every bottleneck found, and are hyper-linked to underlying highlight aerial photographs that open in separate windows. This collection of materials is suitable for the full range of mobility-related planning activities, from acquiring an executive-level understanding of the nature of congestion throughout the region, to providing data for specific long-range planning studies, to simply supplying an archive of photographs, graphics and rating tables for reports & slide shows about specific highway corridors.

Mobility Assessment and Bottleneck Changes, 2007/2008 vs. 2004/2005

This report will provide answers to the following questions:

1. Where were the major recurring bottlenecks found on the surveyed state network during the '07/08 survey period? Which were most severe?
2. Where and to what degree has congestion been spreading on the state network since the '04/05 survey period?
3. Where has mobility improved on the surveyed network since the '04/05 survey period, and to what degree is it possible to associate those improvements with completed projects?

Accordingly, **Part One: Current** provides a map-based inventory of system-wide bottlenecks, as documented during the 2007 and 2008 survey flights. It also includes model-based rankings of all significant freeway bottlenecks, including separate 1-hour, 2-hour and 3-hour groupings. **Part Two: Comparison** discusses macro-level measures indicating that, across the system as a whole, less congestion was found in '07/08 than in '04/05 (this finding is confirmed by multiple data sources from the Atlanta urbanized area, as shown, and mirrors findings from many other urbanized areas across the nation). This part also reports that many segments with improved mobility resulted directly from bottleneck elimination projects. Accordingly, such segments are presented with descriptions of what work was done, augmented with before-and-after aerial photographs that show the impact on traffic flow. Similarly, because improved mobility was partly offset by measurements of degraded flow, another section follows that identifies specific segments where congestion had spread (also augmented with before-and-after photography). *Part Two* concludes with a set of *comparative maps*, which are modified versions of the bottleneck maps from *Part One*, introducing the use of green arrows to show where mobility had improved or cleared entirely, and the use of black and gray arrows to depict where congestion did not appreciably change.

Interactive Web-based Resource

As noted briefly above, this report is augmented with a web-based slide show that has been integrated into the official GDOT website. The maps shown in this report are also found on that website, and are linked to several thousand highlight aerial photographs that illustrate typical traffic conditions at each bottleneck. That website also contains links to the underlying traffic quality database, where users can generate reports that show how traffic performance ratings have changed since 1998. The link can be found at www.dot.ga.gov/statistics/trafficsurvey/.

Underlying Documentation and Methodologies

Underlying technical reports that contain systemwide performance rating maps and tables, as well as descriptions of the specific methodologies used to generate them, are provided under separate cover and are available for download through the GDOT website. For 2007 and 2008, the survey reports are entitled:

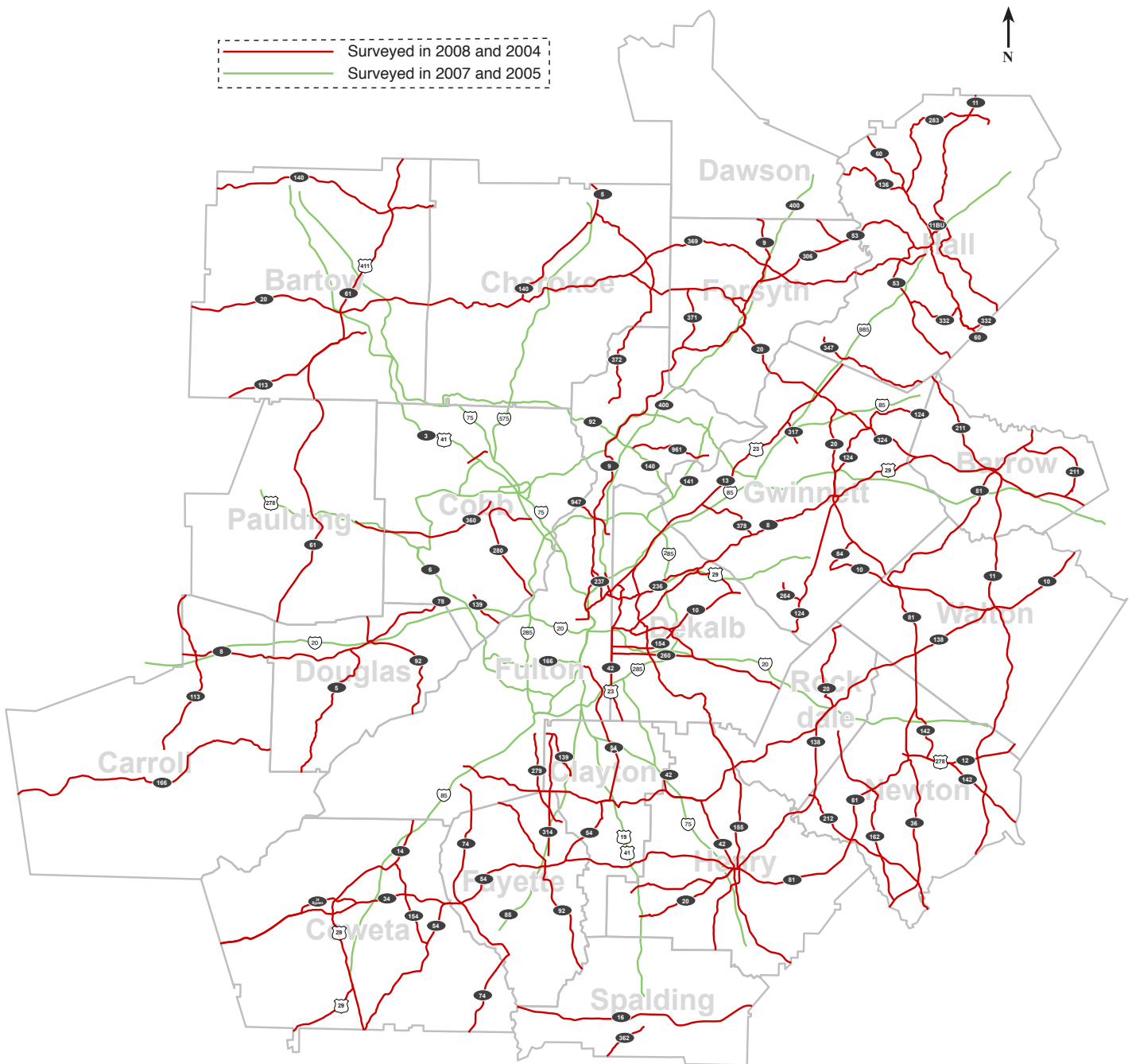
1. *Traffic Quality on the Atlanta Regional Highway Network: VOLUME ONE: Freeways (2007);*
2. *Traffic Quality on the Atlanta Regional Highway Network: VOLUME TWO: Arterials (2007 / 2008).*

Survey reports have also been produced for the earlier iterations of this program, and are available for download at the website as described above. They also can be acquired by contacting Skycomp directly (see below).

Questions

This survey program and all associated reports were conducted or generated by Skycomp, Inc. for the GDOT Office of Planning. If there are any questions about this analysis or the underlying methodologies, please contact Skycomp at 410-884- 6900.

2008 SPRING SURVEY: REGIONAL ARTERIAL NETWORK (RED)



(Above) This map shows the second, larger “regional arterial network” in red. This network was defined and first surveyed in 2004 and is comprised of the key signalized arterial state routes not already part of the primary network (green). Coverage of the regional highway network was repeated in the early spring of 2008. (Note: many highways were surveyed only to county boundaries; segments not shown above were not surveyed.)



PART ONE / CURRENT:

Regionwide Mobility Assessment and Bottleneck Inventory, 2007/2008

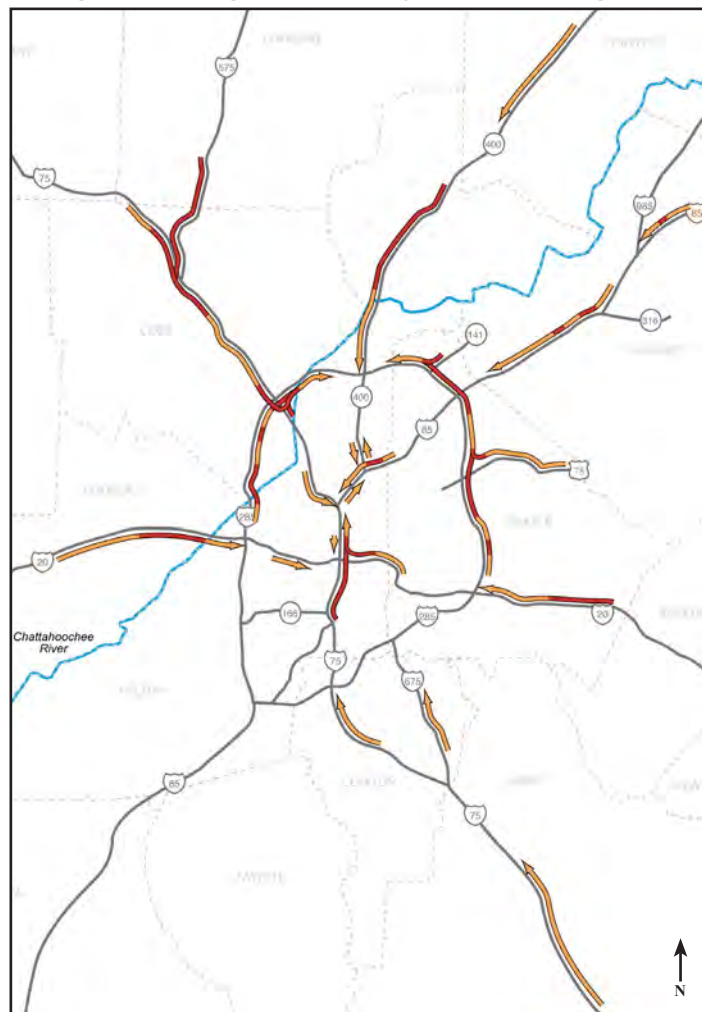
This section of the report discusses the general nature of congestion on the metropolitan-Atlanta area highway network. It also provides an inventory of the region's congested bottlenecks, both freeways and signalized arterials, as derived from 2007 and 2008 survey data. Average delays through the congested freeway zones have been estimated using a density-based speed model; each bottleneck has been ranked in severity based on this model. The most severely-congested signalized arterial corridors are also identified.

Qualitative observations about regional Atlanta congestion

Significant highway traffic congestion in the 22-county Atlanta planning region usually follows the general flow of inbound traffic (toward Atlanta) during the morning commute period, and outbound flow during the evening period. The primary commute routes are the interstate highways and state arterials aligned with the radial movements: I-75 and I-575 to the northwest; SR 400 and I-85 to the northeast; US 78 and I-20 to the east; I-75, US 19/41, SR 85 and I-85 to the south; and I-20 to the west. Not all congested corridors are radial in nature, however. There are major suburb-to-suburb movements in the region that generate congestion, following a circumferential rather than radial pattern. While much of this movement is centered on I-285, other major circumferential corridors include SR 92, SR 120 and SR 20 to the north; SR 20 and SR 124 to the east; SR 138 and SR 920 to the south; and SR 6 and SR 92 to the west.

An important reality in the generation of congestion in this region is that many commuters reside to the north and west of the Chattahoochee River, while many primary work centers are situated south and east of the river. The primary high-volume corridors toward and across this obstacle – SR 400 from the north, I-75 from the northwest (also fed by I-575), I-20 from the west, and I-285 on the west and north sides – generate some of the greatest delays in the region. In fact, many of the circumferential movements in the western and northern areas – SR 20, SR 316 and Barrett Parkway in Cobb County, and SR 120 and SR 961 in Fulton County – are severely congested leading to one of these corridors. The most severely congested arterial corridor – US 41

Figure 1.1 Congested Freeway Zones / Morning 2007



(Above) Typical morning congested zones on the freeway system are shown. Red arrows depict more severe freeway congestion; orange arrows depict less severe or intermittent freeway congestion.

(Opposite) Congested northwest-bound flow on the Perimeter (I-285) at the I-85 interchange in DeKalb County.

– closely parallels I-75 through Kennesaw and Marietta. Other key arterial routes across the river in Fulton County – SR 9, SR 120, SR 140 and SR 141 – are also severely congested.

Another reality that influences the level of highway demand is that the “center of gravity” of the region’s work centers is north of downtown Atlanta, with many job centers located near the northern interchanges of I-285 and I-85. Thus the greater traffic flows on I-285 converge to the north in the morning and diverge to the south in the evening; severe congestion on I-285 is found along those movements. South of Atlanta, I-75/I-85 carries demand not only toward downtown Atlanta in the morning, but also toward the northern employment centers, and thus is highly congested. During the evening peak period in the other direction, heavy southbound flow on I-75/I-85 toward downtown Atlanta competes with traffic merging from the downtown area; the result is greater southbound congestion toward the central business district than on the south side away from it.

Congestion is also found in the outlying counties that appears to be local in nature. Bottlenecks like this are found in Cumming / Silver City, Buford, Gainesville, Lawrenceville, Loganville, Winder / Russell, Covington, McDonough, Lovejoy, Fayetteville, Peachtree City, Newnan, Douglasville, Dallas / Hiram, and Cartersville. While many of these problems do not appear significant compared to the congestion on the high-volume corridors closer to Atlanta, in fact some long, single-file queues routinely recur on rural state routes where drivers do not have viable alternative routes; in many cases, such delays are substantial.

Lastly, it should be noted that in the Atlanta urbanized area, as in most large metropolitan areas, about 10-20 percent of highway lane-miles actually operate under congested conditions during peak demand periods (this figure varies depending on how ‘congestion’ is defined). Still, it is evident from the aerial photography that highway traffic moves with reasonable freedom on a large part of the system. Even when ordinary incidents occur that block traffic flow, rarely is the entire network in an area actually “gridlocked”. Thus, while this report is focused where mobility is inhibited, it should be recognized that, on a daily basis, many parts of the system carry peak- period traffic efficiently and at high travel speeds.

Figure 1.2 Congested Freeway Zones / Evening 2007



(Above) Typical evening congested zones on the freeway system are shown. Red arrows depict more severe freeway congestion; orange arrows depict less severe or intermittent freeway congestion.

Section 1.1: Performance Rating Overview and Freeway Congestion Rankings

On freeway links, the average density of traffic flow is derived from overlapping time-lapse digital photographs taken at one-hour intervals over four different workdays. The morning survey periods are 6:30 to 9:30 a.m.; the evening periods are 4:00 to 7:00 p.m. Raw vehicle counts are first taken from the photography. Using these counts, traffic densities are calculated for all surveyed links (by flight, by direction and by time period). Then a screening is performed to identify and exclude atypical data – values either well above or below typical levels from all of the survey dates. The (typical) traffic density values that remain after this screening are averaged together by hour and by link, and then converted to level-of-service performance ratings “A” through “F”, based on ranges defined in the *2000 Highway Capacity Manual* (a widely-used planning guide produced by the *Transportation Research Board of the National Academy of Sciences*). The performance ratings database, therefore, contains six ratings for each

highway segment, per direction: one for each of three morning hours, and one for each of three evening hours.

Because there is a mathematical correlation on freeways between vehicle densities and average travel speeds, it is possible to estimate average travel times for each link using a speed/density look-up table (this process is described in detail in *Appendix B* of the underlying technical report, *Traffic Quality on the Atlanta Regional Highway Network: VOLUME ONE: Freeways (2007)*). Once this is done, link-by-link values are next aggregated into total travel time estimates through each congested zone, and then converted into corresponding average congested travel speeds. Last, the total minutes of delay are estimated through each congested zone, by subtracting the time it would have taken driving at a typical uncongested speed of 60 mph from the survey-generated travel time estimates. This is the basis for the ranking of freeway congested zones, as shown below in Figures 1.3 (morning) and 1.4 (evening).

Figure 1.3 Ranking of Congested Freeway Zones (one-hour duration) / Morning 2007

FREEWAYS / MORNING PERIOD / 2007														
FOUR-DAY "SNAPSHOT" RANKING OF CONGESTED ZONES									EST. AVG	EST. TRAV	EST. ZONE	2007	2005	
COUNTY	PERIOD	ROUTE	Dir	CONGESTED ZONE		DIST	SPEED	TIME	DELAY					
(vicinity)	AM			(from)	(to)	(miles)	(mph)	(min)	vs. 60 mph	RANK	RANK			
Fulton	6:30 - 7:30	SR 400	SB	WINDWARD PKWY - I-285		14.2	27	31.8	>15 min.	#1	#1*			
Dekalb	7:30 - 8:30	I-285	NB/WB	SR 12 (CONVINGTON HWY) - ASHFORD-DUNWOODY RD		15.4	30	30.9	>15	#2			top 5	
Cobb	6:30 - 7:30	I-575	SB	SIXES RD - I-75		11.1	27	24.4	>10	top 5			top 5	
Cobb	6:30 - 7:30	I-75	SB	SR 92 - WINDY HILL RD		17.1	35	29.1	>10	top 5			#2	
Cobb	7:30 - 8:30	I-285	NB/EB	US 278 - RIVERSIDE DR		11.7	31	22.6	>10	top 5			top 10	
Dekalb	6:30 - 7:30	I-20	WB	TURNER HILL RD - I-285		7.7	27	16.9	>5	top 10			top 10	
Fulton	7:30 - 8:30	I-75/I-85	NB	SR 166 (LAKEWOOD FWY) - US 29 (NORTH AVE)		5.8	25	14.1	>5	top 10			top 10	
Cobb	6:30 - 7:30	I-20	EB	SR 92 (FAIRBURN RD) - I-285		12.7	39	19.4	>5	top 10			top 10	
Gwinnett	7:30 - 8:30	I-85	SB	OLD PEACHTREE RD - PLEASANTDALE RD		12.2	42	17.3	>5	top 10			top 5	
Dekalb	7:30 - 8:30	US 78	WB	PARK PLACE BLVD - I-285		8.2	40	12.3	>3	top 10			top 20	
Fulton	7:30 - 8:30	I-20	WB	FLAT SHOALS RD - I-75/I-85		4.7	33	8.5	>3	top 20			top 10	
Dekalb	7:30 - 8:30	SR 141	SB	JIMMY CARTER BLVD - I-285		3.4	29	7.1	>3	top 20			top 20	
Fulton	8:30 - 9:30	I-85	SB	SR 155 (CLAIRMONT RD) - US 29 (NORTH AVE)		6.9	39	10.5	>3	top 20			top 20	
Fulton	8:30 - 9:30	I-75	SB	PACES FERRY RD - US 29 (NORTH AVE)		5.6	44	7.6	<3	top 20			top 20	
Fulton	7:30 - 8:30	I-75/I-85 HOV	NB	SR 166 (LAKEWOOD FWY) - I-20		3.6	39	5.6	<3	top 20			top 20	
Clayton	6:30 - 7:30	I-75	NB	US 19/US 41 - I-285		3.4	39	5.2	<3	top 20			top 20	
Forsyth	6:30 - 7:30	SR 400	SB	SR 20 (BUFORD HWY) - MCFARLAND RD		6.9	53	7.8	<1	top 20			top 1*	
Cobb	7:30 - 8:30	I-20	EB	MARTIN LUTHER KING JR. DR - ASHBY ST		1.8	49	2.2	<1	top 20			top 20	
Henry	6:30 - 7:30	I-75	NB	JODECO RD - I-675		4.9	55	5.3	<1	top 20			top 20	
Henry	7:30 - 8:30	I-75	NB	JONESBORO RD - JODECO RD		1.4	49	1.7	<1	top 20			top 20	

* In 2005, a continuous zone of southbound congestion was found on SR 400 between SR 20 and I-285. In 2007, two distinct, separated congested zones were found.

Figure 1.4 Ranking of Congested Freeway Zones (one-hour duration) / Evening 2007

FREEWAYS / EVENING PERIOD / 2007												
FOUR-DAY "SNAPSHOT" RANKING OF CONGESTED ZONES									EST. AVG. TRAV. TIME	EST. ZONE DELAY	2007 RANK	2005 RANK
COUNTY (vicinity)	PERIOD PM	ROUTE	Dir	CONGESTED ZONE (from) (to)		DIST (miles)	SPEED (mph)	TIME (min)	vs. 60 mph			
Dekalb	17:00 - 18:00	I-285	EB/SB	SR 400	SR 12 (CONVINGTON HWY)	16.5	25	39.3	>20 min.	#1	#2	
Cobb	17:00 - 18:00	I-75	NB	MT. PARAN RD	CHASTAIN RD	14.3	33	26.0	>10	#2	top 5	
Cobb	17:00 - 18:00	I-285	WB/SB	ASHFORD-DUNWOODY RD	PACES FERRY RD	9.9	36	16.5	>5	top 5	top 10	
Forsyth	17:00 - 18:00	SR 400	NB	WINDWARD PKWY	SR 141 (PEACHTREE PKWY)	7.1	31	13.6	>5	top 5	#1**	
Gwinnett	17:00 - 18:00	I-85	NB	I-285	SR 316	10.2	40	15.4	>5	top 5	top 5	
Henry	17:00 - 18:00	I-75	SB	SR 138 (STOCKBRIDGE PKWY)	JODECO RD	6.3	34	11.1	>3	top 10	top 10	
Fulton	17:00 - 18:00	SR 400	NB	GLENRIDGE PERIMETER CONN.	NORTHBRIDGE RD	5.7	37	9.3	>3	top 10	#1**	
Dekalb	17:00 - 18:00	I-20	EB	SR 155	PANOLA RD	5.0	39	7.7	<3	top 10	top 20	
Fulton	18:00 - 19:00	I-85	SB	SR 400	SR 10 (FREEDOM PKWY)	4.9	40	7.4	<3	top 10	top 5	
Fulton	17:00 - 18:00	I-75/I-85	SB	I-75/I-85 MERGE	I-20	3.4	35	5.9	<3	top 10	NR	
Gwinnett	17:00 - 18:00	SR 316	EB	RIVERSIDE PKWY	WALTHER BLVD	1.8	26	4.1	<3	top 20	top 20	
Cobb	17:00 - 18:00	I-285	SB	ATLANTA RD	I-20	5.9	45	7.9	<3	top 20	top 20	
Fulton	17:00 - 18:00	I-75/I-85 HOV	SB	I-75/I-85 MERGE	SR 10 (FREEDOM PKWY)	2.4	39	3.7	<3	top 20	top 20	
Clayton	17:00 - 18:00	I-75	SB	I-285	SR 221 (FOREST PKWY)	0.8	25	1.9	<3	top 20	top 20	
Dekalb	17:00 - 18:00	US 78	EB	SR 236 (HUGH HOWELL RD)	PARK PLACE BLVD	1.8	39	2.8	<3	top 20	top 20	
Clayton	17:00 - 18:00	I-675	SB	ELLENWOOD RD	SR 42 / US 23	2.7	48	3.4	<1	top 20	top 20	
Cobb	17:00 - 18:00	I-20	WB	SIX FLAGS DR	LEE RD	5.3	55	5.8	<1	top 20	top 10	
Dekalb	17:00 - 18:00	US 78	EB	I-285	COOLEGE RD	1.2	45	1.6	<1	top 20	NR	
Fulton	17:00 - 18:00	I-20	EB	I-75/I-85	MORELAND AVE	2.4	51	2.8	<1	top 20	NR	
Fulton	17:00 - 18:00	SR 400	SB	ABERNATHY RD	I-285	1.5	47	1.9	<1	top 20	top 10	

** In 2005, a continuous zone of northbound congestion was found on SR 400 between the Glenridge Perimeter Connector and SR 141. In 2007, two distinct, separated congested zones were found.

The ranking tables in Figures 1.3 and 1.4, however, do not take into account duration of congestion. Therefore, a similar analysis was performed by screening the performance ratings database for zones that were severely congested (densities of 60 passenger cars per lane per mile or greater) for periods of either two or three hours. (These zones were typically sub-zones of the congested zones previously discussed.) Using the simplification of one median density value for each congested zone, separate rankings were made for two-hour congested zones and for three-hour zones. Those results are posted in Figure 1.5 (2-hour duration) and Figure 1.6 (3-hour duration).

Figure 1.5 Ranking of Congested Freeway Zones (two-hour duration) / Morning and Evening 2007

FREEWAY RANKINGS / 2007 / MORNING AND EVENING								
2-HOUR DURATION CONGESTED ZONES								
PERIOD:	ROUTE	DIR	CONGESTED ZONE	DIST	EST. AVG SPEED	EST. TRAV TIME	EST. ZONE DELAY	2007 RANK
(MORNING (AM))			(from) (to)	(miles)	(mph)	(min)	vs. 60 mph	AM
6:30-8:30	SR 400	SB	Appr. SR 120 (Old Milton Pkwy) to Chattahoochee River	6.0	19	18.9	>10 min.	#1
6:30-8:30	I-75	SB	Appr. Chastain Rd to N Marietta Pkwy	7.0	28	15.0	>5	#2
6:30-8:30	I-20	WB	Evans Mill Rd to Panola Rd	2.9	18	9.7	>5	top 5
6:30-8:30	I-575	SB	Appr. Bells Ferry Rd to I-75/85	4.0	24	10.0	>5	top 5
7:30-9:30	I-285	NB/WB	Chamblee-Tucker Rd to Peachtree Rd	3.5	25	8.5	>5	top 5
7:30-9:30	I-75/I-85	NB	Appr. University Ave to SR 10 (Freedom Pkwy)	3.5	25	8.4	>3	top 10
6:30-8:30	I-20	EB	SR 6 (Thornton Rd) to Chattahoochee River	3.8	27	8.3	>3	top 10
6:30-8:30	I-285	NB	SR 10 (Memorial Dr) to SR 8 / US 29	3.5	30	6.9	>3	top 10
7:30-9:30	I-20	WB	Moreland Ave to I-75/85	2.4	29	5.0	<3	top 10
6:30-8:30	I-285	NB	SR 280 (Cobb Dr) to Atlanta Rd	1.3	28	2.8	<3	top 10
7:30-9:30	I-85	SB	SR 378 (Beaver Run Rd) to Indian Trail Rd	1.1	33	2.0	<1	top 20
6:30-8:30	I-75	NB	SR 331 (Forest Pkwy) to I-285	0.8	32	1.5	<1	top 20
EVENING (PM)								
4:00-6:00	I-285	EB/SB	Appr. Chamblee-Dunwoody Rd to Lavista Rd	7.7	19	24.3	>15 min.	#1
4:00-6:00	I-20	EB	Appr. I-285 to Beyond Wesley Chapel Rd	2.5	26	5.8	>3	#2
4:00-6:00	I-75/I-85	SB	I-85 to US 29 (North Ave)	1.2	26	2.7	<3	top 5

Figure 1.6 Ranking of Congested Freeway Zones (three-hour duration) / Morning and Evening 2007

FREEWAY RANKINGS / 2007 / MORNING AND EVENING								
3-HOUR DURATION CONGESTED ZONES								
PERIOD:	ROUTE	DIR	CONGESTED ZONE	DIST	EST. AVG SPEED	EST. TRAV TIME	EST. ZONE DELAY	RANK
(MORNING (AM))			(from) (to)	(miles)	(mph)	(min)	vs. 60 mph	AM
6:30-9:30	I-75	SB	Barrett Pkwy to N Marietta Pkwy	5.0	30	10.0	>5 min.	#1
6:30-9:30	I-285	EB/SB	SR 141 (Peachtree Indus. Blvd) to Peachtree Rd	0.8	26	1.9	<3	#2
EVENING (PM)								
4:00-7:00	I-285	EB/SB	Appr. Chamblee-Dunwoody Rd to Peachtree Rd	1.5	23	3.9	<3 min.	#1
4:00-7:00	I-285	EB/SB	I-85 to Chamblee-Tucker Rd	0.6	16	2.3	<3	#2
4:00-7:00	I-75/I-85	SB	I-85 to US 29 (North Ave)	1.2	28	2.5	<3	top 5

Signalized arterial highway performance ratings and congested zone overview

The nature of a congested arterial zone is that it usually is comprised of a series of closely-spaced congested signalized intersections. For that reason, the density-based performance rating system used on freeways is not suitable for analysis of interrupted-flow traffic. Accordingly, a surrogate (non-HCM) level-of-service methodology has been used that rates traffic flow based on the size of vehicle groups moving along each segment and the degree of queuing present at signalized intersections (for methodology, see *Traffic Quality on the Atlanta Regional Highway Network: VOLUME TWO: Arterials (2007 / 2008), Appendix A*, as referenced on page two of this report). The most severely-congested arterial zones -- especially during the morning period -- include those that most closely parallel the most severely congested freeway zones, or else carry traffic toward those corridors: US 41 through Kennesaw and Marietta (parallel to I-75); SR 120 approaching I-75 from the west through Marietta; SR 92 approaching SR 400 through Roswell from the west; and three arterials approaching SR 400 from the east: SR 140, SR 961 and SR 120. While the barrier-nature of the Chattahoochee River indirectly affects all of those routes, it also directly generates severe local congestion near each of its bridges, both to the northeast -- SR 140, SR 141, SR 120 and SR 20; and the southwest in Douglas County -- SR 92 and SR 6. Inside the I-285 perimeter, traffic winding along the narrow arterials through DeKalb County generated many successive bottleneck intersections, particularly along SR 236, SR 8, SR 10, and SR 42. To the east, significance delays were incurred on US 78 through Snellville. Delays were generally less severe to the south; however, major bottlenecks were found along all of the signalized state arterials approaching the vicinity of I-285. (Note: the bottleneck maps on the following pages provide an overview of each surveyed arterial corridor; specific details of each congested zone can be found in the technical report named above or on the web site module described on page two.)

Bottleneck inventory maps (Sections 1.2 and 1.3)

The next two sections present a map-based bottleneck inventory of the region, including both freeway and arterial routes. Congestion of greater severity is represented by red arrowheads; less-severe or intermittent congestion is represented by orange arrowheads. The predominant directions of commuter “tidal flows” are evident in these maps, as well as areas where “feeder” or parallel arterial corridors are most affected by congestion. The sources of data for these bottleneck maps were the 2008 survey of the regional arterial network, and the 2007 survey of the extended primary network (see network definitions at the front of this report.) More information about each bottleneck is also available through the interactive resource on the GDOT website. Representative aerial photographs have been presented with the maps; the entire archive of highlight aerial bottleneck photography is available for viewing through the website (see page two discussion under “Web-based Interactive Resource” for link).

Figure 1.8 Legend for Bottleneck Maps



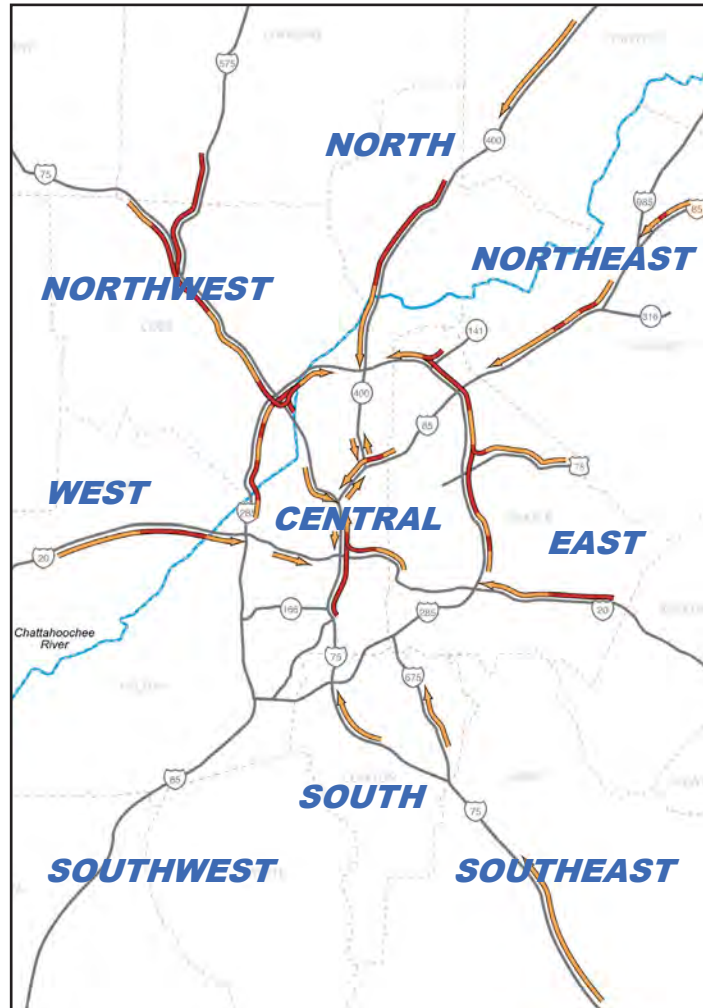
Current Traffic Conditions:	1. Legend for Bottleneck Maps ('04/'05 Composite):
CONGESTED:	
MARGINALLY CONGESTED:	
NOT CONGESTED:	(No Arrow)

Figure 1.7 Region Designations for the Bottleneck Maps

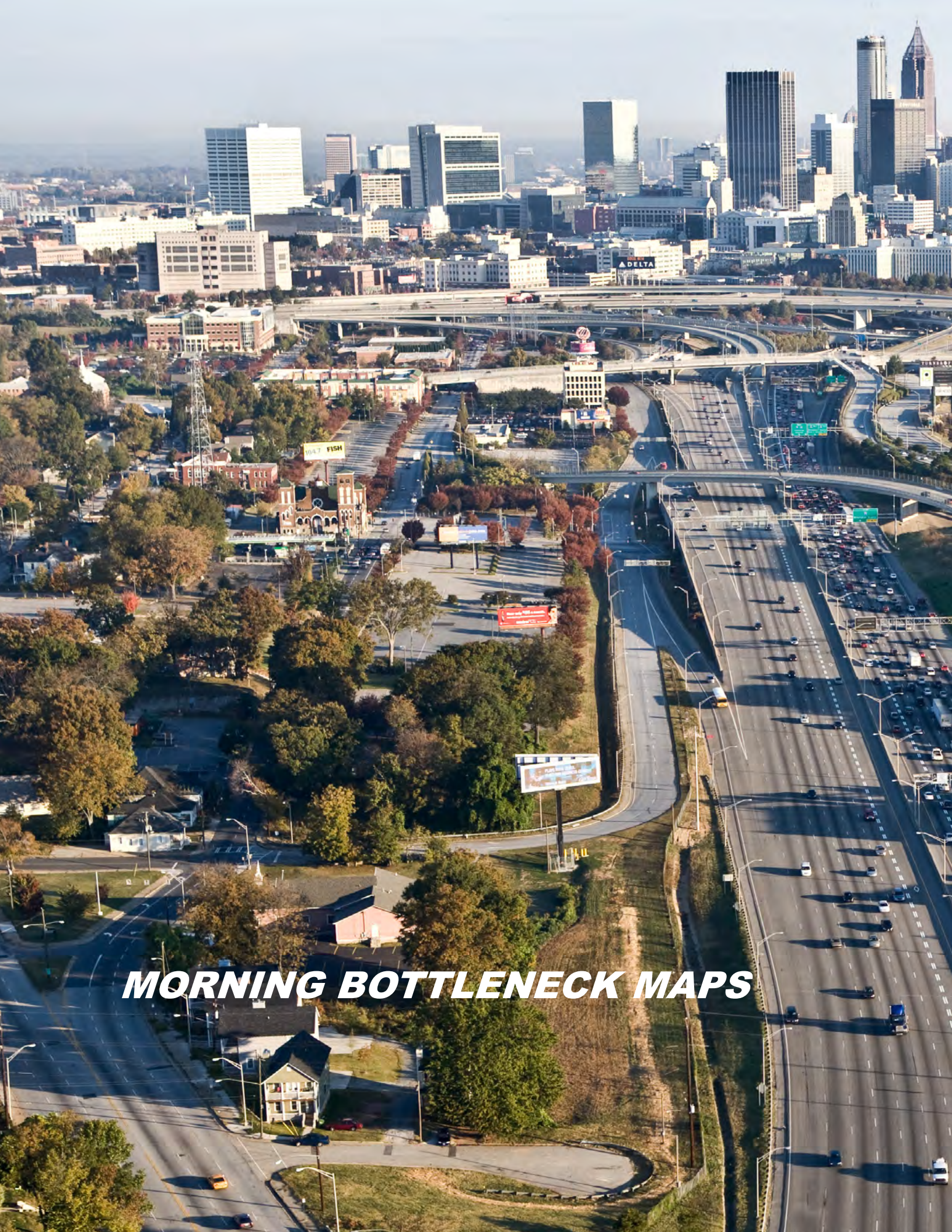


Section 1.2: Morning bottleneck inventory maps:

- central region (I-285 perimeter), pp 12-13;
- north and northwest regions, pp. 14-15;
- northeast region, pp. 16-17;
- east region, pp. 18-19;
- south and southeast regions, pp. 20-21;
- west and southwest regions, pp. 22-23

Section 1.3: Evening bottleneck inventory maps:

- central region (I-285 perimeter), pp 26-27;
- northwest region, pp. 28-29;
- northeast region, pp. 30-31;
- east region, p. 32;
- south and southeast regions, pp. 34-35.
- west and southwest regions, p. 36

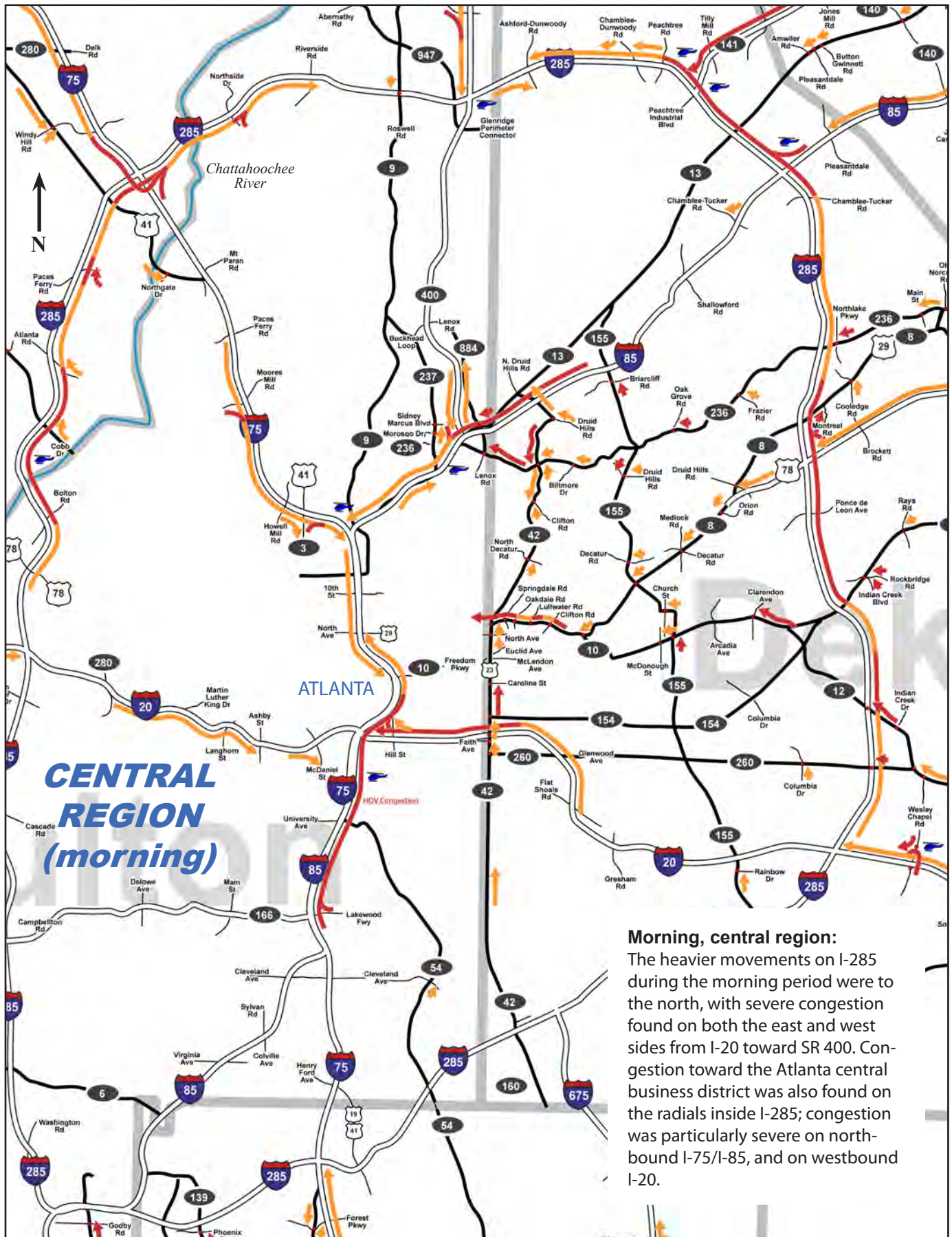


MORNING BOTTLENECK MAPS



(Congested northbound flow on I-75 / I-85 at Turner Field)

Section 1.2: Morning Bottleneck Inventory Maps, 2007 / 2008

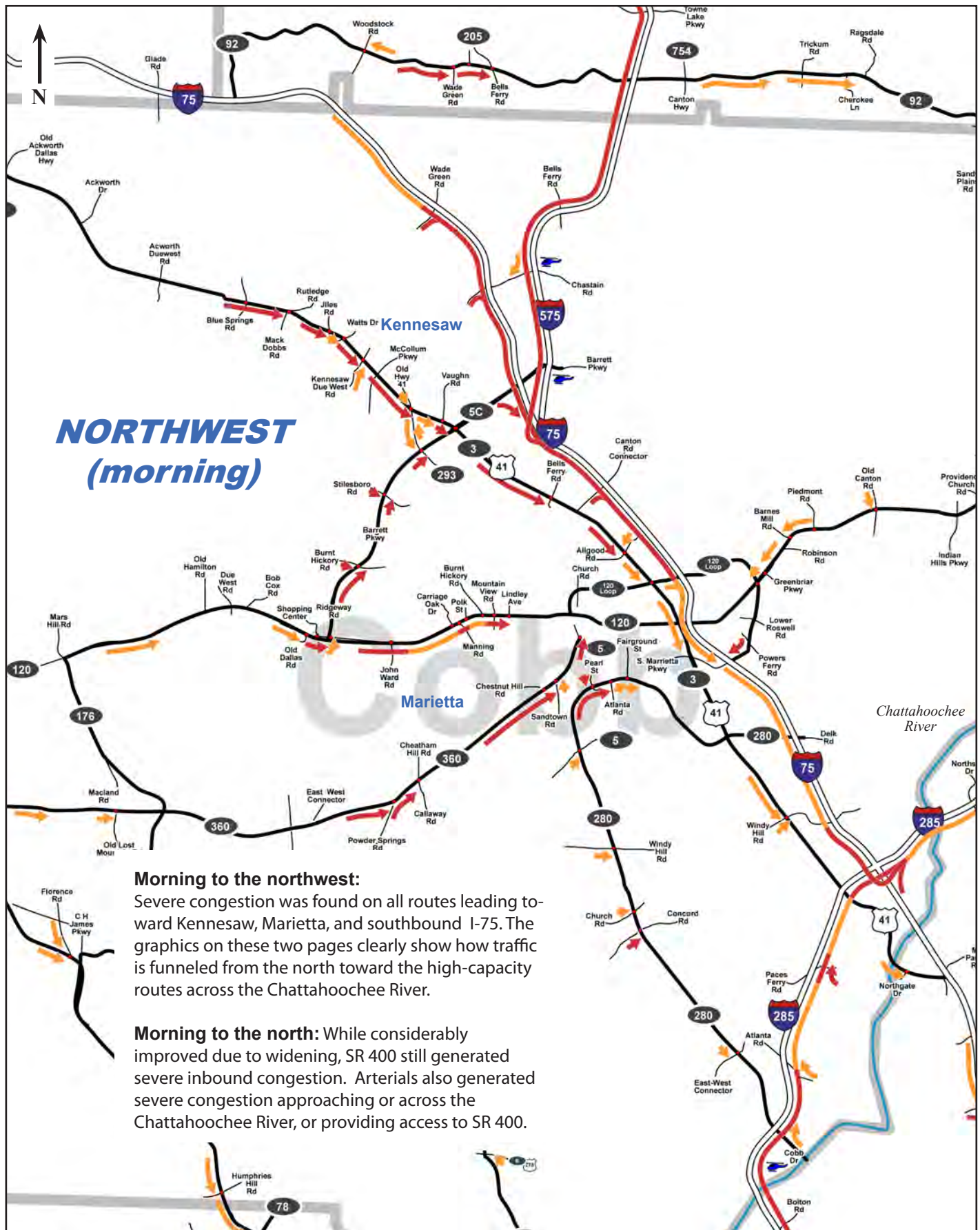


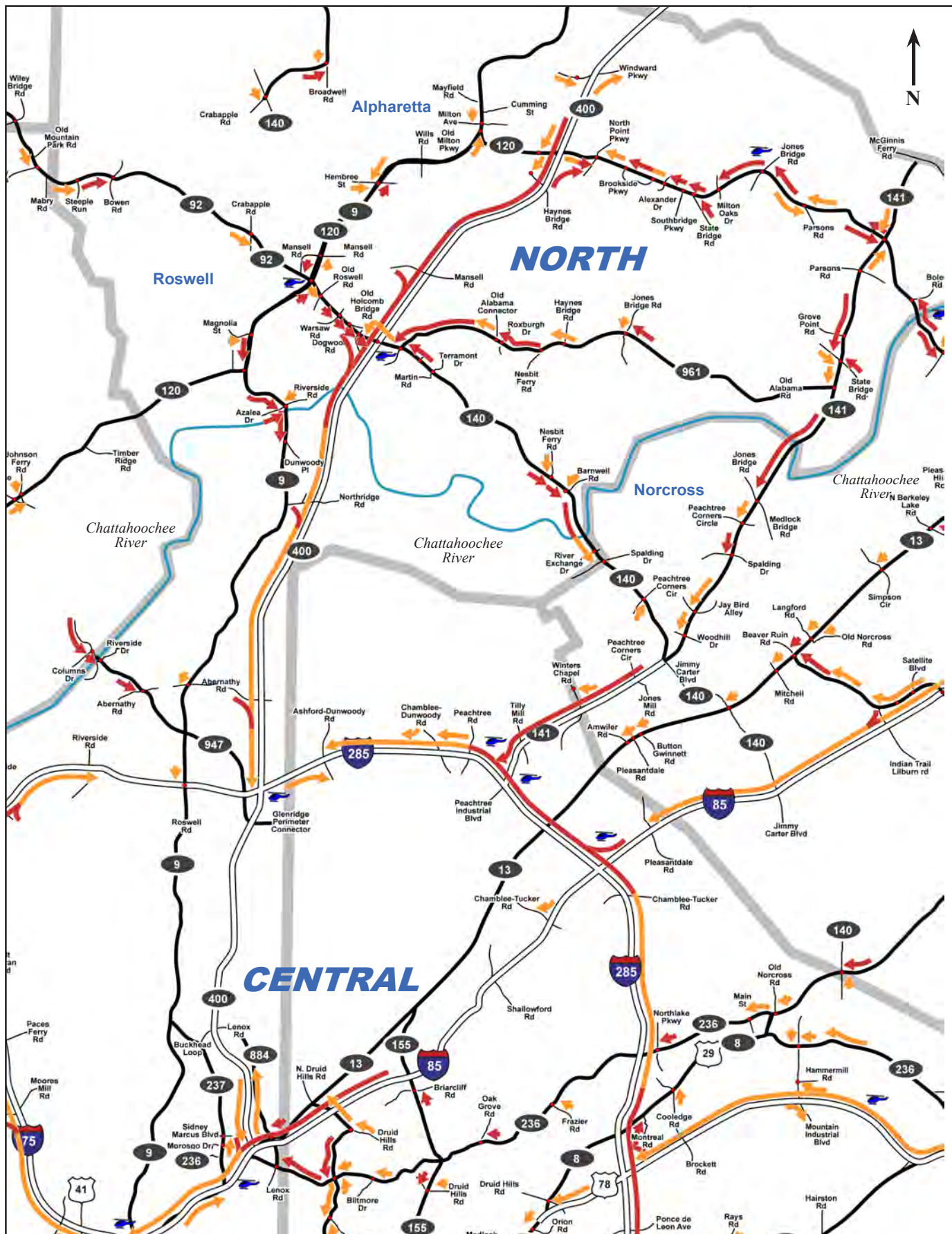


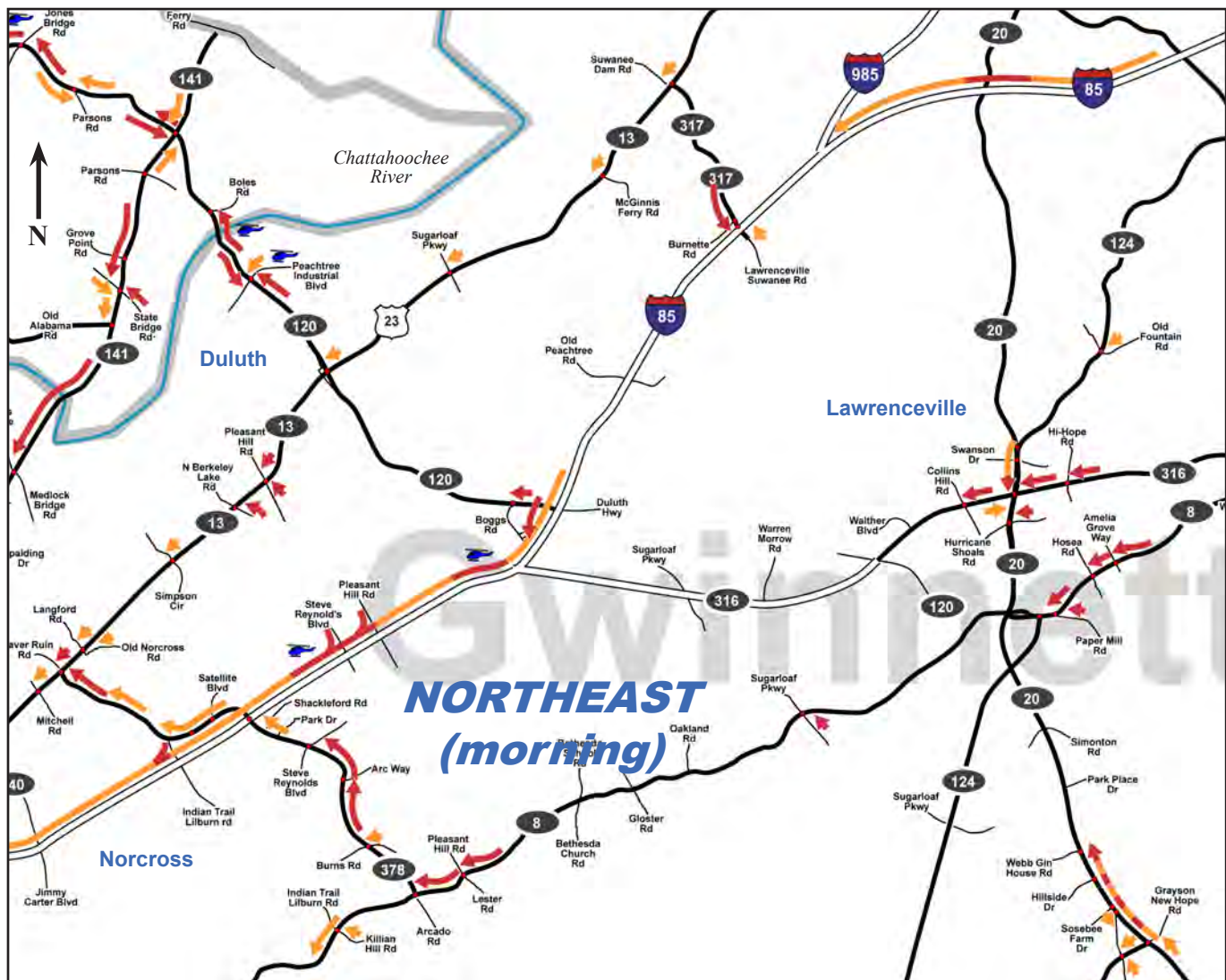
(Above) This photo is oriented to the north, and shows I-85 at Lenox Rd just northeast of the SR 400 interchange (which is just off the left edge of the photo). Local congestion on SR 13 / Sidney Marcus Blvd is visible above I-85, caused or exacerbated by drivers from southbound I-85 seeking to access northbound SR 400.



(Above) During the peak period, a one- to two-mile zone of westbound congestion was found on SR 8 between SR 10 and SR 42. This photo, oriented to the north, shows the head of that queue to the left, at SR 42. Signals generating congestion included: SR 42, Springdale Rd, Oakdale Rd, Lullwater Rd, and Clifton Rd. On some days but not others, a mostly continuous zone of congestion was found between Clifton Rd and SR 42.









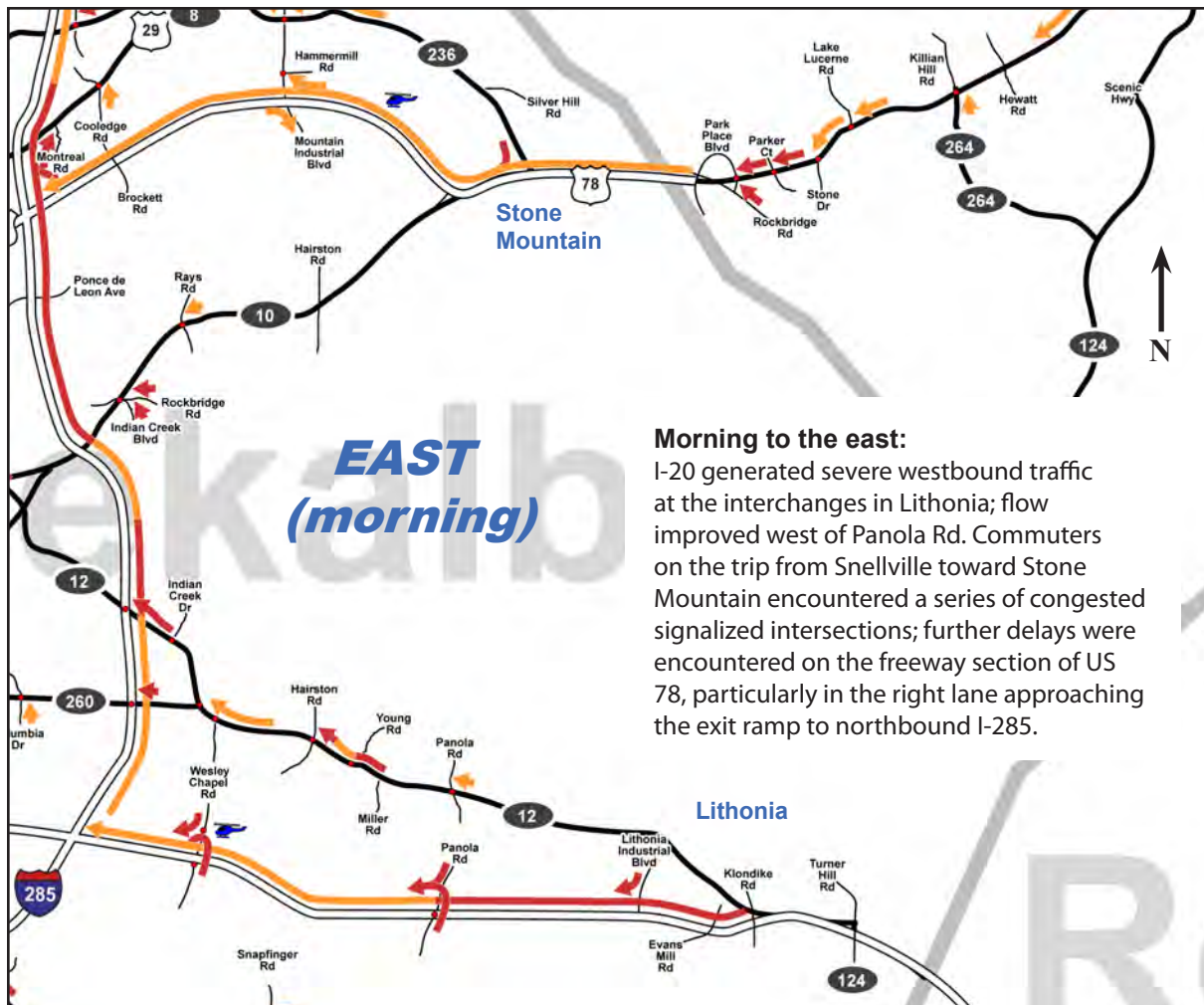
(Above) This view of I-85 shows the reconstruction of the interchange at SR 316; the view is toward the west, with southbound flow to the left. The smaller of the two new flyover ramps (top) was built to carry SR 316 traffic directly to the I-85 service road without requiring a merge onto the mainline. When these ramps were completed and opened during the course of the fall 2007 survey flights, westbound congestion historically found on SR 316 was eliminated.

Morning to the northeast:

The I-85 corridor was congested in the southbound direction approaching the I-985 merge, again through the construction zone beginning at the SR 316 interchange, and again at the major merges thru Indian Trail Lilburn Rd. SR 378 was congested bringing traffic toward I-85 from the southeast. To the east, arterial bottlenecks on parallel approaches to downtown Lawrenceville were found. South of Lawrenceville, arterial bottlenecks not oriented along Atlanta radials were found.

To the far northeast, mostly minor congestion was found on some of the approaches into Gainesville. However, a long, single file queue was found on SR 11BU approaching the signal at Enota Dr.

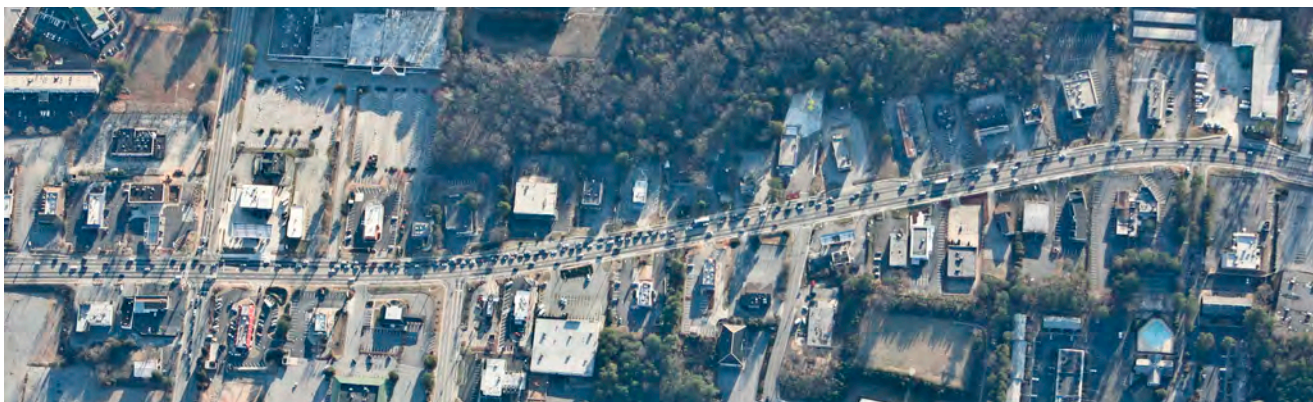




(Above) This photo is oriented looking toward the south across I-20. Westbound congestion is shown, at 7:10 a.m., at the Lithonia Industrial Blvd. entrance ramp.



(Above) Westbound congestion on US 78 is shown approaching Mountain Industrial Blvd in Stone Mountain. This condition was depicted on the map with an “orange” arrow. The uniform spacing between vehicles indicates flow at reduced speeds, but faster than on severely-congested “red” corridors such as I-20 through Lithonia.



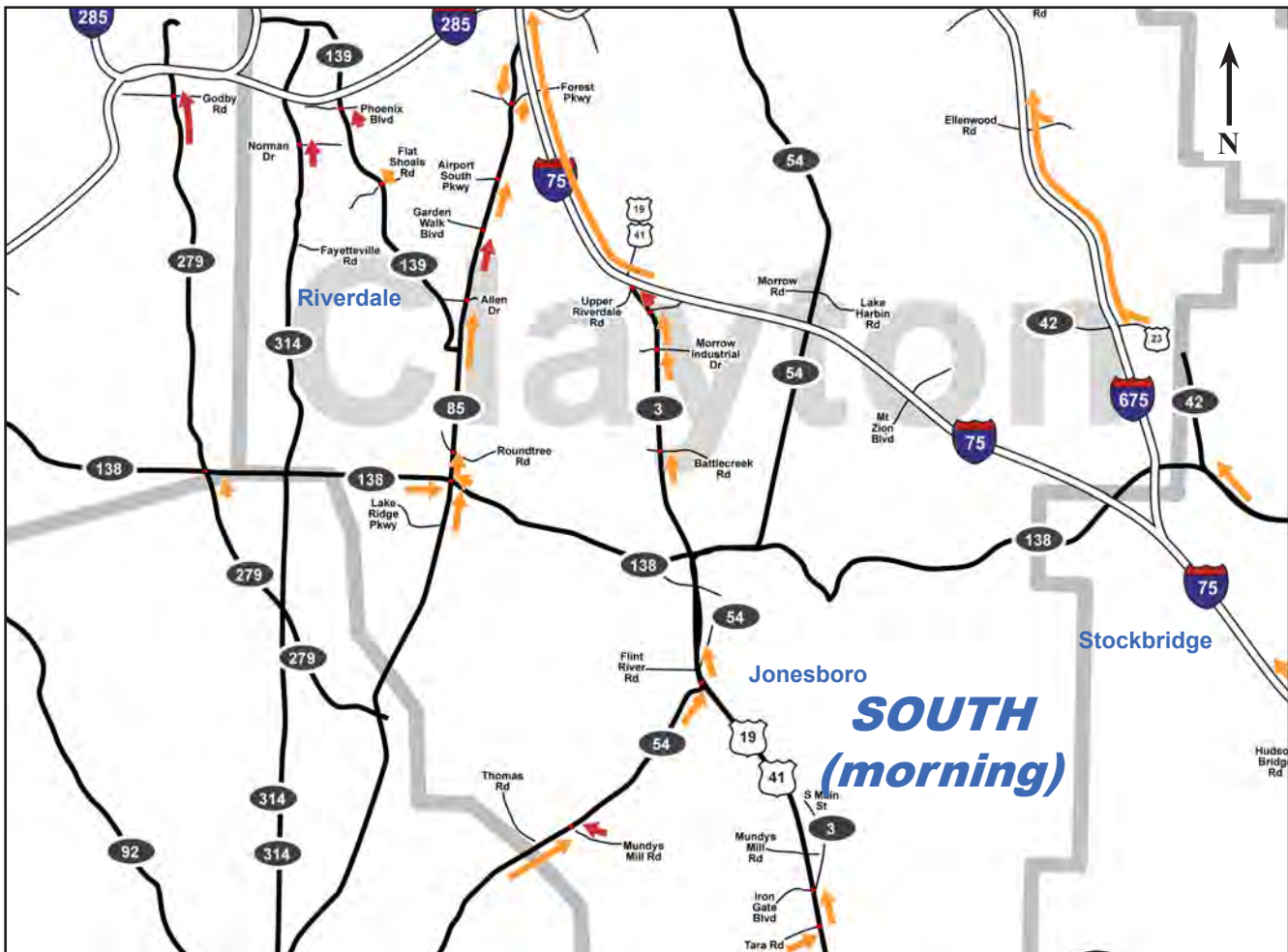
(Above) In College Park, northbound congestion (to the left) was usually found on Old National Highway (SR 279) approaching the signal at Godby Road.



(Above) Minor northbound congestion was found on I-75 through McDonough and Stockbridge, mainly before 8:00 a.m., as shown in this photo at the Jonesboro Road interchange. While this zone of congestion extended for up to six miles, stretches with delays were generally interspersed between segments with travel at higher speeds.



(Above) This photo is oriented to the south; it shows the westbound queue typically found on SR 155 in McDonough at the signal at Industrial Blvd. The I-75 interchange is just off the photo to the right.



Morning to the south:

Northbound highway users from the south generated minor congestion compared to the approaches from the north. Still, long queues were found -- sometimes intermittently -- at various signalized intersections along the radial arterials, especially where each of the routes neared I-75 or I-285. On the interstates, only minor delays were found on I-675. Weaving and merging on I-75 through the interchanges near and at I-285 generated significant mainline congestion.

Morning to the far southeast:

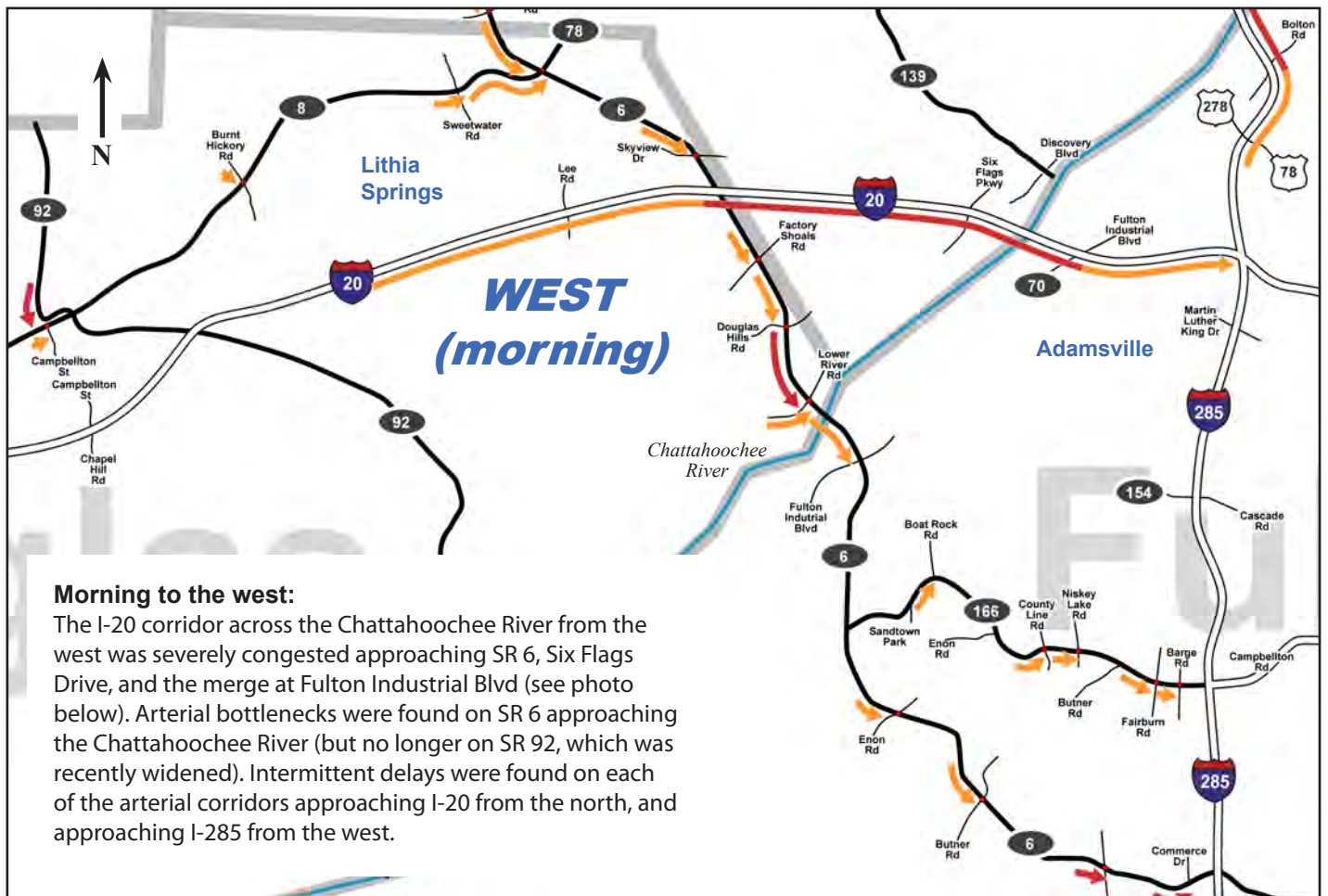
Minor northbound delays were found on I-75 through the interchanges near McDonough and Stockbridge. Minor arterial delays, usually intermittent, were found at various locations on surveyed routes in McDonough (fewer than previously found due to completed improvement projects).





(Above) This photo orientation is to the south. The eastbound queue shown here, on SR 34 Bypass at SR 14, was only intermittently found (therefore it was depicted with an orange arrow on the map).





(Above) While there were several eastbound merges that generated severe congestion on I-20, the primary bottleneck was shortly before I-285, at the two-lane merge shown here (Fulton Industrial Blvd).

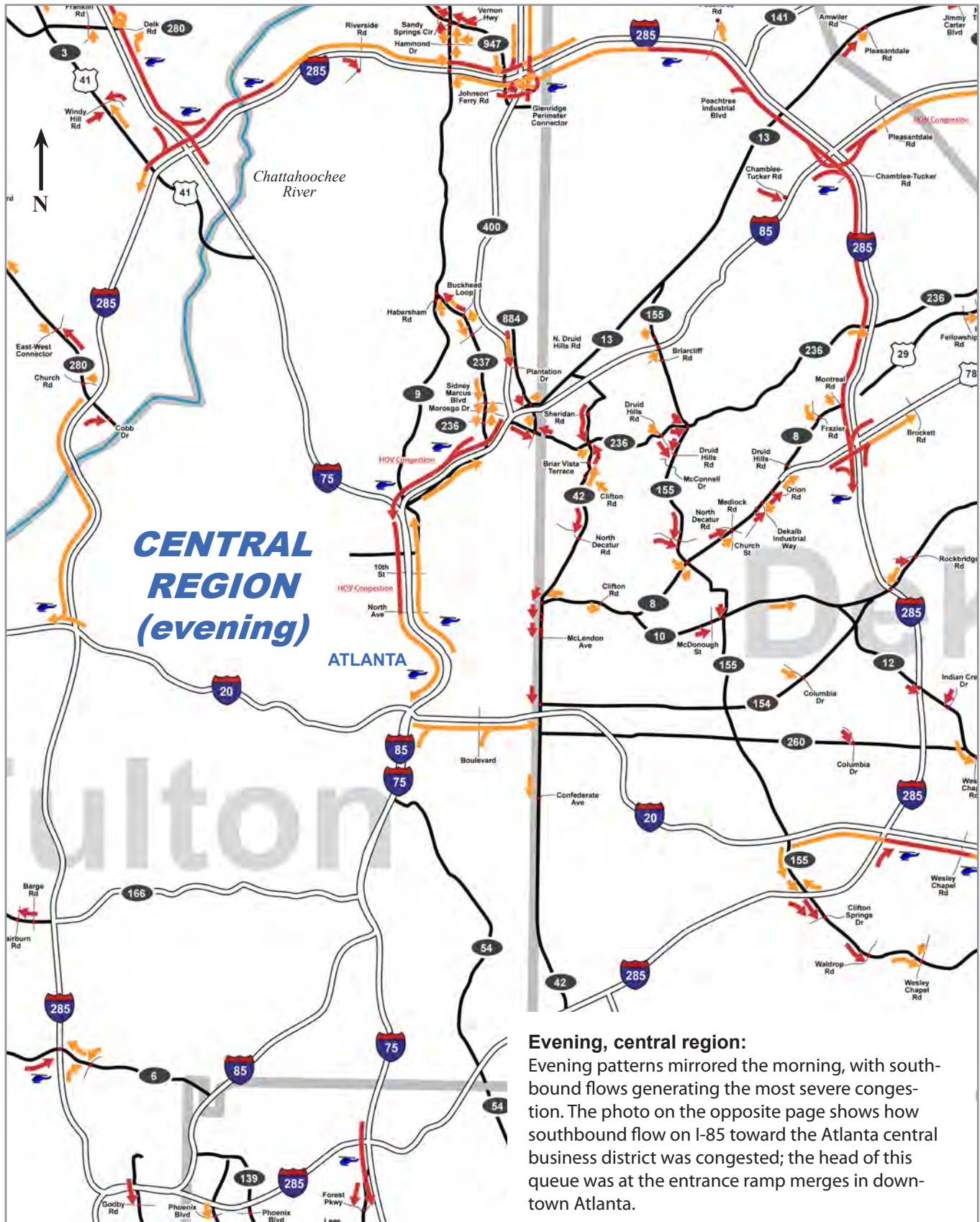
EVENING BOTTLENECK MAPS





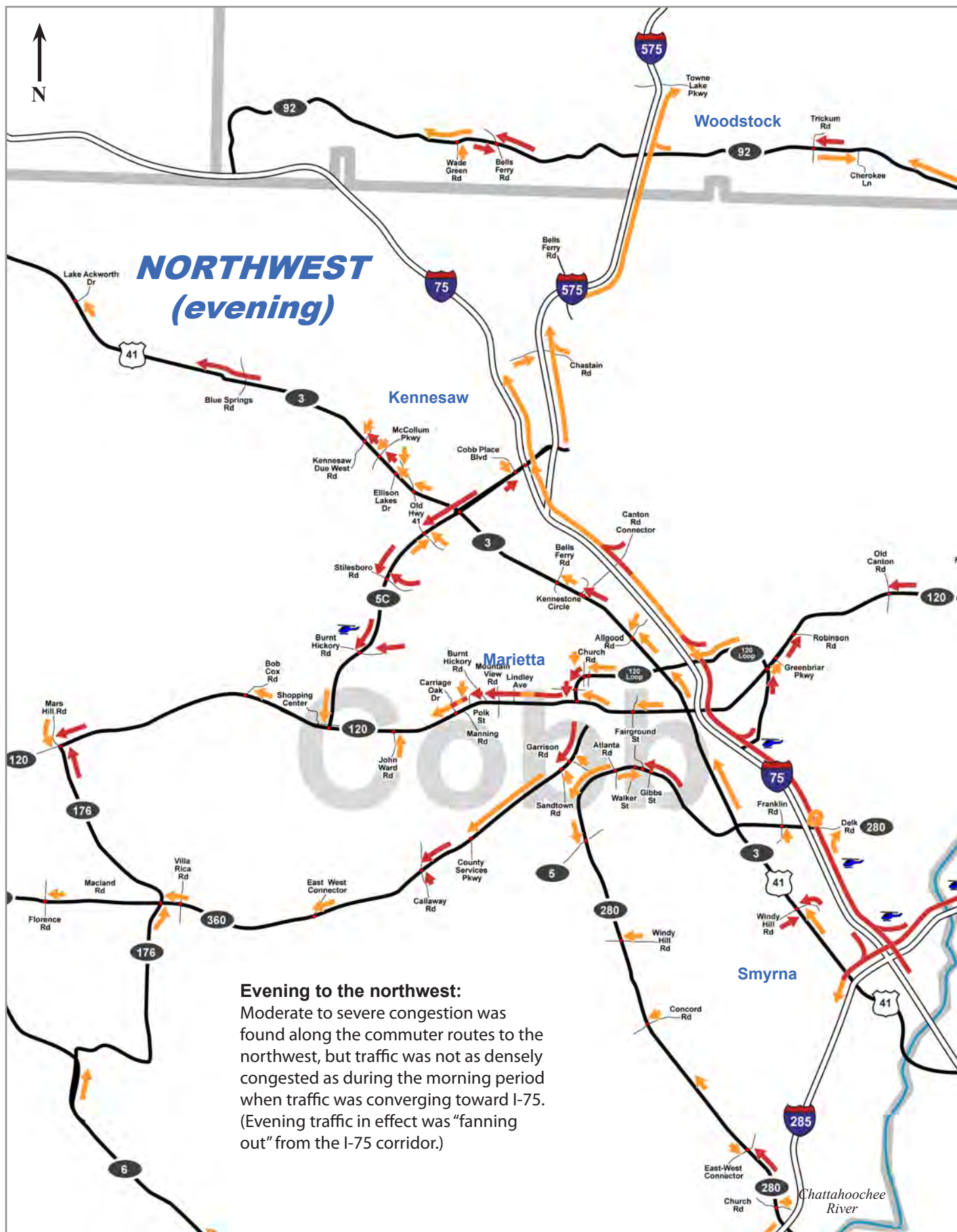
(Congested southeast-bound flow on I-285 at I-85)

Section 1.3: Evening Bottleneck Inventory Maps, 2007 / 2008





(Above) Typical evening southbound congested flow toward the Atlanta central business district on I-85 in Fulton County, one mile north of the I-75 merge.



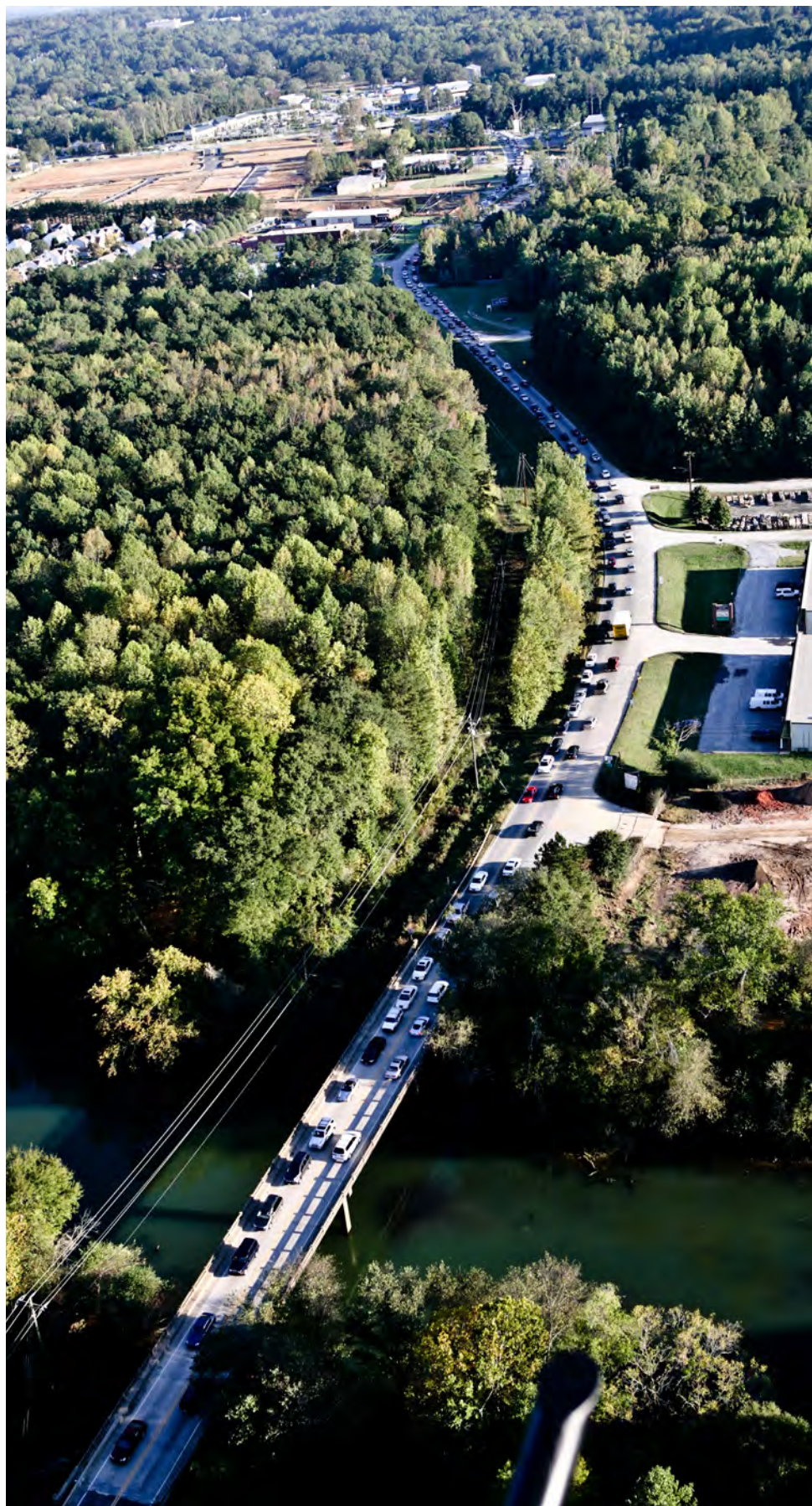


(Above) Northbound congestion is shown on I-75, while looking south at the Canton Road connector. This traffic was less densely congested than farther south.

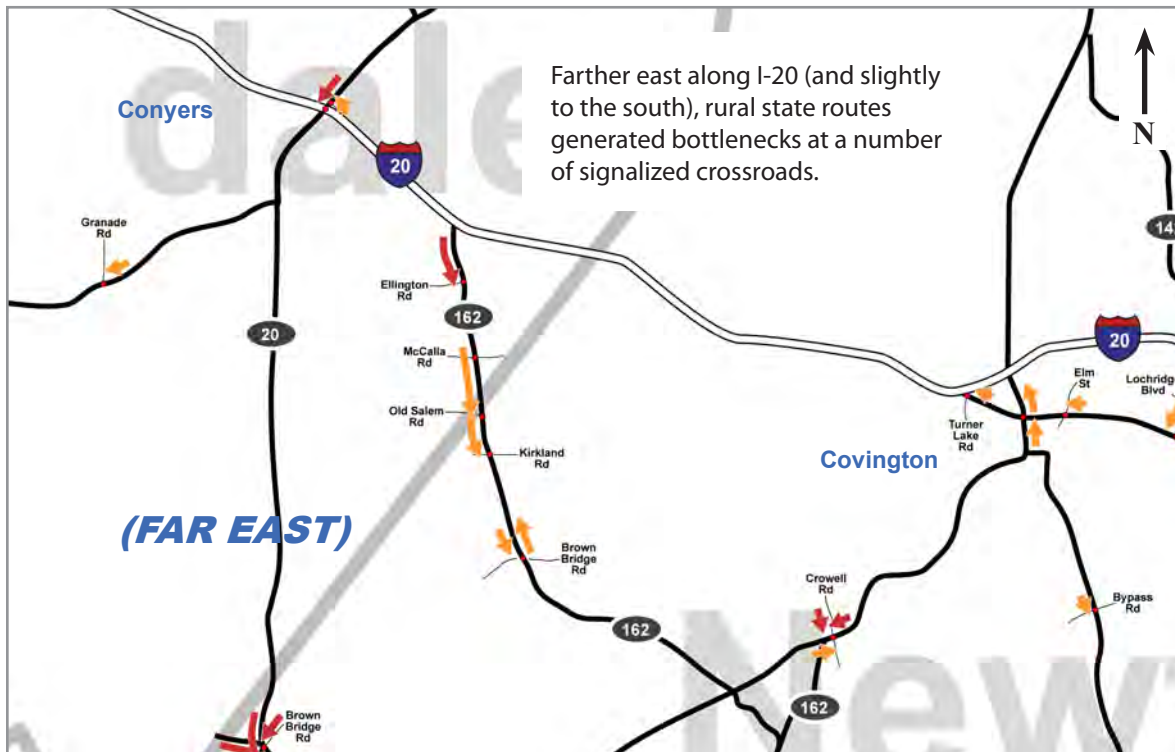
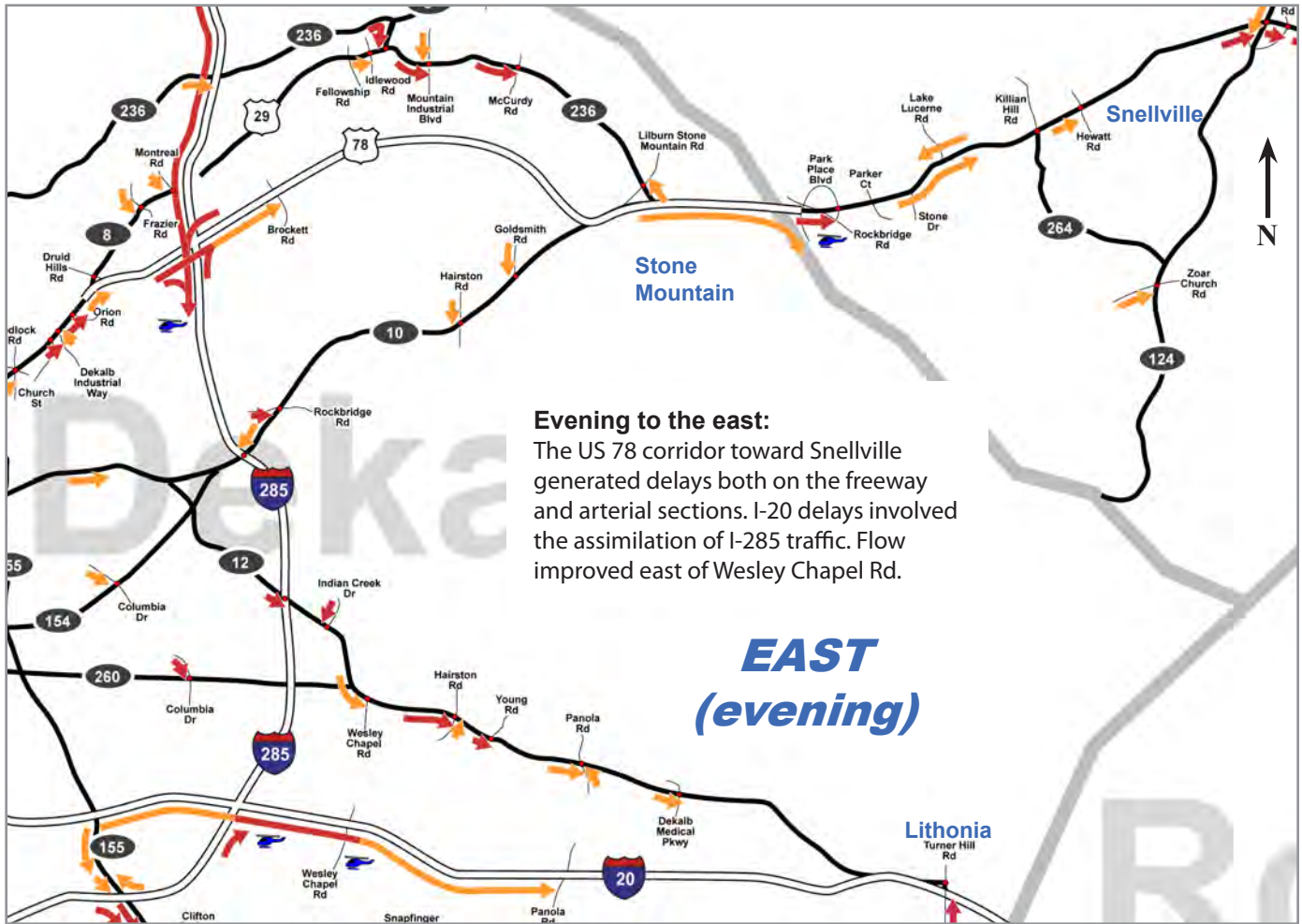
Evening to the north and northeast:

Radial outbound congestion along I-85, SR 141 and SR 400 was found to the north and northeast, the reverse of morning conditions. Parallel congestion was also found at many signals on SR 9 through Roswell, and on SR 13 and SR 8. Moderate to severe arterial congestion was found on all of the approaches to the Chattahoochee River bridges. Congestion was also found along the suburb-to-suburb arterials, although some of this demand was probably distribution of radial traffic. Traffic signals on outlying arterials near Lake Lanier and south toward Lawrenceville also generated significant delays, particularly SR 20.





(Above) This view is looking south. Evening congestion was found both ways on Abbotts Bridge Rd (SR 120) crossing the Chattahoochee River.

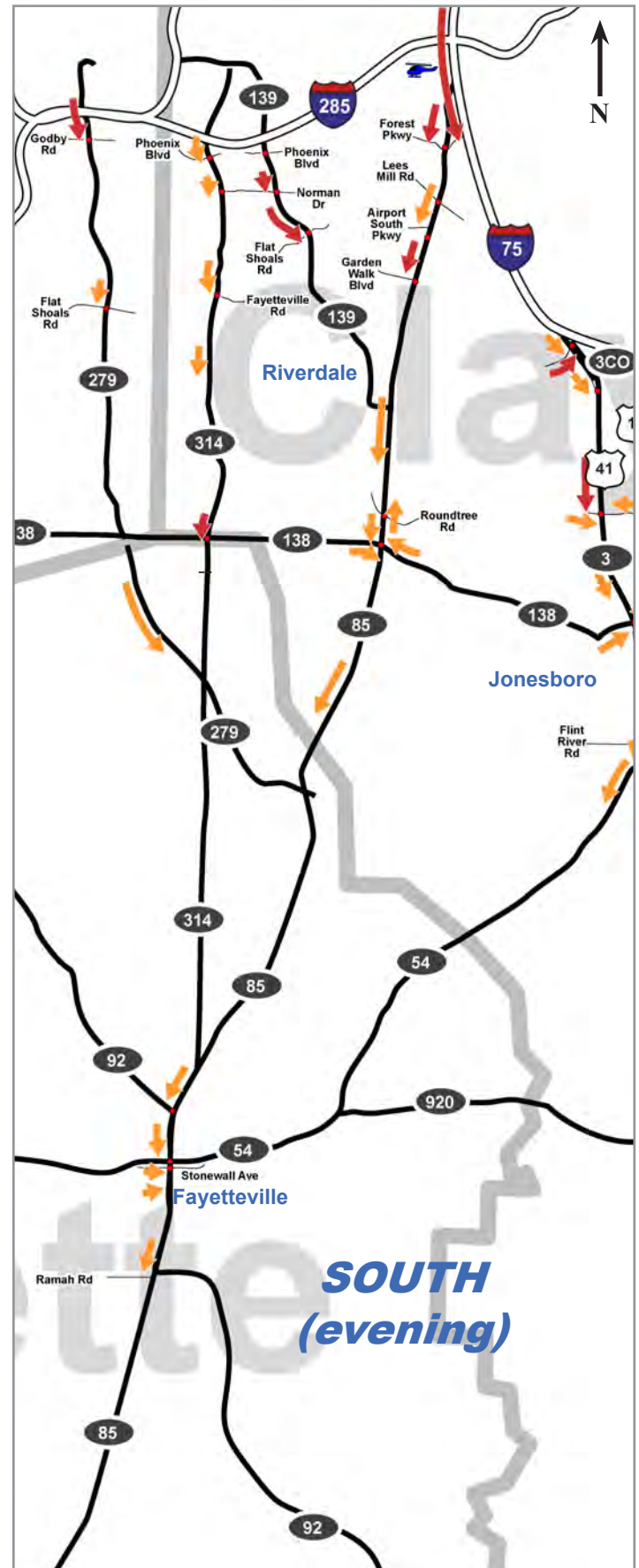


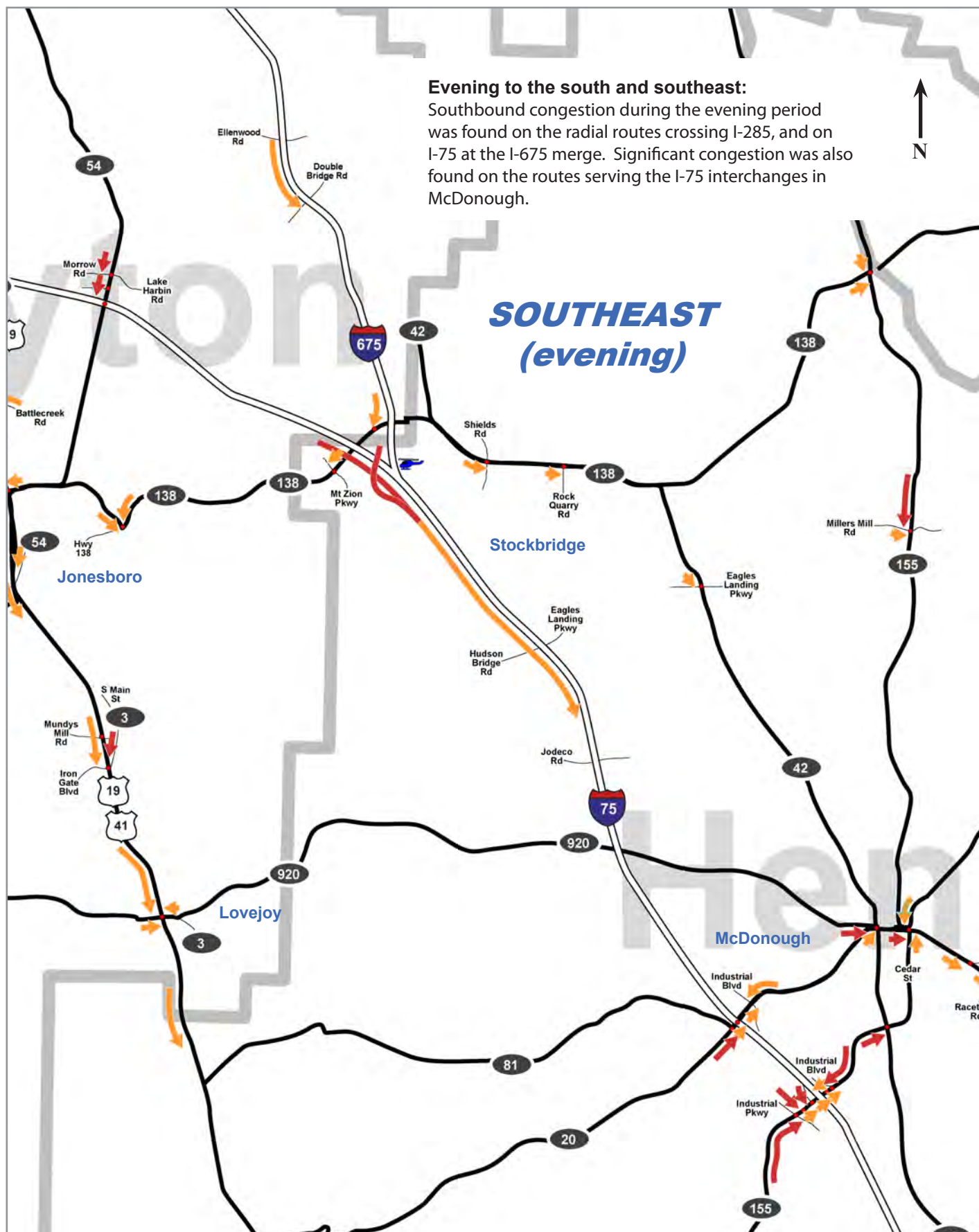


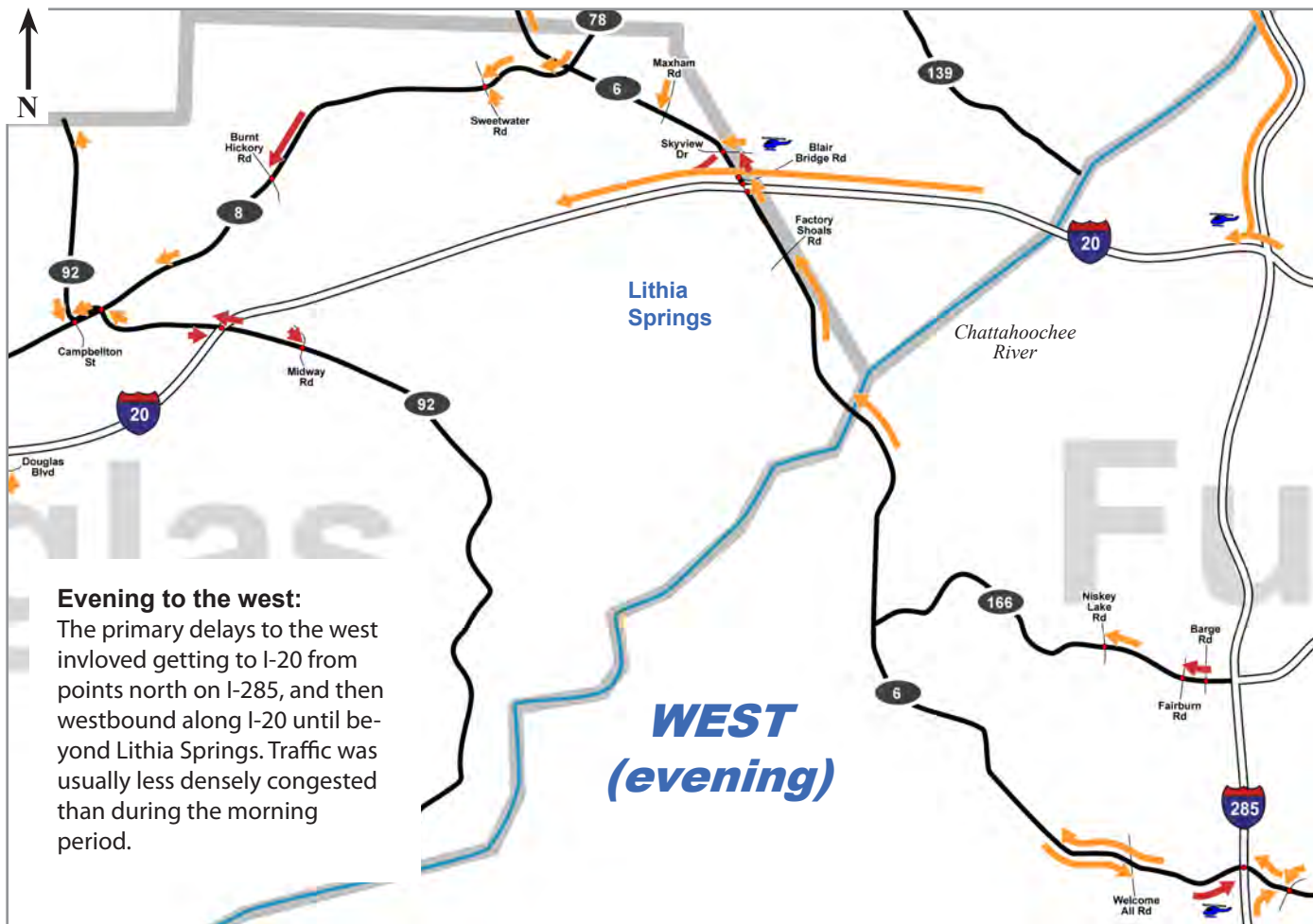
(Above) Typical evening eastbound congestion on US 78 in Stone Mountain is shown approaching the freeway terminus at the signal at Park Place Blvd.



(Above) Typical southbound congestion on SR 85 in Riverdale is shown approaching the signal at Forest Parkway.









(Above) Typical evening northbound congestion on SR 6 (Thornton Road) in Lithia Springs is shown approaching the signal at Skyview Drive. The I-20 interchange is visible near the top of the photo.

PART TWO / COMPARISON: Bottleneck Changes, 2007/2008 vs. 2004/2005

Part Two reviews the nature of system-wide congestion on large metro-area highway systems, and notes how transportation agencies work to preserve or improve mobility in the face of steady growth. Next it examines mobility trends in the metro-Atlanta area, and then discusses the degree to which mobility changes can be accounted for by recently-completed improvement projects.

The balanced nature of highway mobility and congestion in large metropolitan areas

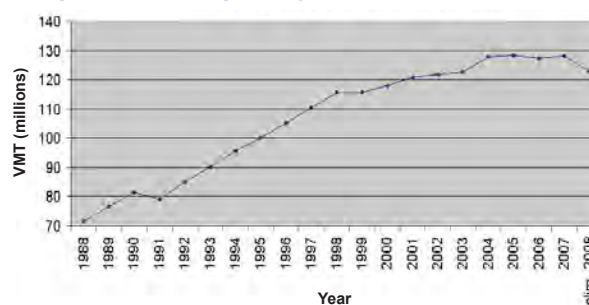
Ordinary recurring congestion is essentially the queuing of vehicles waiting to be served. Some degree of delay is acceptable to drivers as the price to pay for living or working where they want to, using a convenient transportation mode (single-occupancy automobile for the majority), or traveling at preferred times. When delays become unacceptably long, drivers choose which conveniences to give up: some will time their trips to avoid the peak hour; some will switch to car pools or transit; others may even decide to reside closer to work. The collective outcome of these choices is the maintenance of a daily balance between the number of vehicles being served at any given time and the number of vehicles delayed in queues.

Since the mass production of automobiles began almost 100 years ago, demand for space on the highway system has grown steadily. Ever-increasing numbers of vehicles have forced drivers to adjust to ever-greater delays. Public agencies have responded over time with programs to build new highways or add travel lanes, increase efficiency of existing lanes, provide modal alternatives such as HOV lanes or expanded transit, or provide incentives to travel during off-peak hours. The underlying objective of these programs has not been to mitigate all congestion, but to commit financial resources wisely to reduce congestion or preserve mobility where possible. Performance monitoring programs such as this one provide not only input for general planning activities, but feedback regarding the effectiveness of congestion-mitigation investments.

Trends in the metro-Atlanta planning region

The trend toward greater congestion and decreased mobility has long been recognized in the metro-Atlanta area. In an earlier *Skycomp* report entitled *Mobility Assessment and Bottleneck Changes, 2005 vs. 2001*, this trend was confirmed by comparing performance ratings from the 2005 aerial survey with ratings from an identical survey conducted in 2001. While minor improvements were found in a few locations, conditions were degraded almost everywhere that differences were found. Based on the number of congested freeway lane-miles during peak commute periods in the 22-county planning region, level-of-service “F” congestion increased from about 7% to 11% of the surveyed system. Those findings were consistent with the average daily vehicle-miles traveled statistic (VMT) that is compiled each year from GDOT sensor data: as shown in *Figure 2.1*, average daily VMT followed its historical trend, and increased significantly between 2001 and 2004. Similarly, travel-time indexes (the aggregated ratios of actual travel times during congested periods to uncongested travel times, produced from GDOT’s NaviGator data by GRTA) also indicated a gradual degradation of mobility on the heart of the freeway system (see *Figure 2.2* data points from 2002 to 2006).

Figure 2.1 Average Daily Vehicle Miles Traveled (VMT)

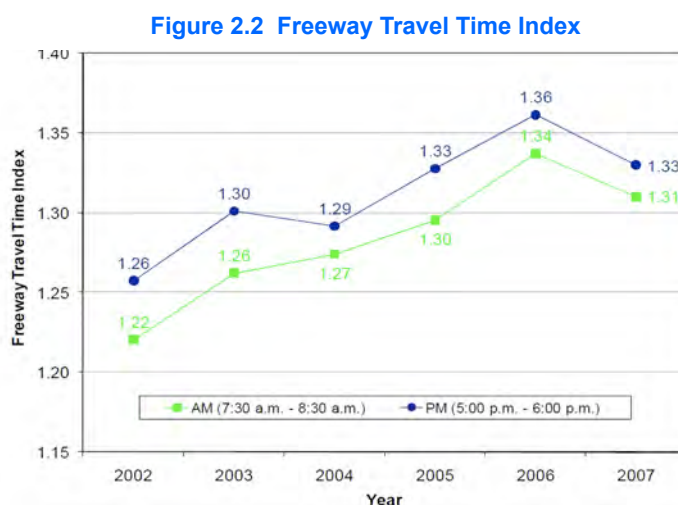


(13-county Atlanta metro-area; GDOT calculations from sensor data; 1988 - 2007 compiled by GRTA)

Recent macro-level findings in the Atlanta region

This spread of congestion can be expected to stop or even reverse if demand levels off or decreases, or if sufficient capacity & efficiency improvements are made to the system. This appears to have happened in the metro-Atlanta region between 2004 and 2008, based on the findings of four (mostly) independent sets of performance monitoring statistics:

- 1) VMT (as discussed above) was essentially unchanged between 2004 and 2007, and declined by 4.3% in 2008 (*Figure 2.1, far right*);
- 2) Travel-time index statistics (as discussed above) declined in 2007, returning to 2005 levels (*Figure 2.2, far right*).
- 3) A new source of travel time index statistics available for 2006 and later -- offered by a commercial service provider named *INRIX, Inc.* -- asserts that Atlanta's aggregate travel time index was essentially unchanged from 2006 to 2007, and was significantly improved from 2007 to 2008 (see the *INRIX National Traffic Scorecard, 2007 and 2008 Annual Reports*.) (Note: *INRIX's* TTI calculations cannot be compared directly to the values calculated by the GRTA methodology because the underlying methodologies and assumptions are not the same; *INRIX's* primary inputs are real-time travel speed feeds from the GPS monitoring systems of large commercial trucking fleets. *INRIX* also states that it uses publicly-available sensor data; therefore it is possible that its TTI calculations are not completely independent from the agency calculations shown in *Figure 2.2*).
- 4) As measured by the 2007 and 2008 aerial survey flights during morning and evening three-hour peak periods, the number of surveyed highway lane-miles operating for one hour under congested conditions declined by about 13% for both the freeway and arterial sub-systems:



(2008 Transportation MAP Report, GRTA, p. 6)

CONGESTION ON FREEWAYS (defined for freeways as LOS F): During the '07/08 survey period, measurements of freeway congestion in the 22-county metro-Atlanta planning region (actually surveyed entirely in 2007) decreased from about 10.5% to 9% of the total peak-period lane-mile-hours (*Figure 2.3*).

CONGESTION ON ARTERIALS (defined for arterials as surrogate LOS E or F): Measurements of arterial congestion during this period also decreased from about 16.5% to 14.5% of the total lane-mile-hours (*Figure 2.4*).

Figure 2.3 Freeway Congestion (Red), 2005 vs. 2007

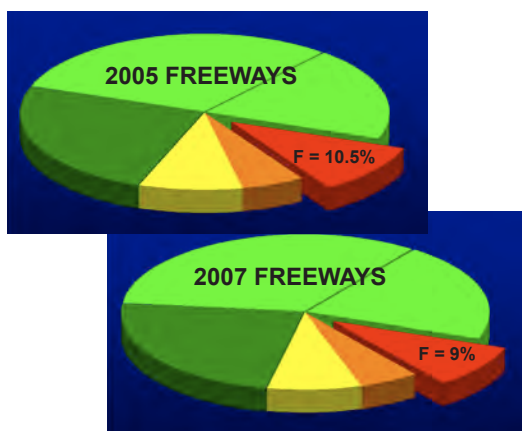
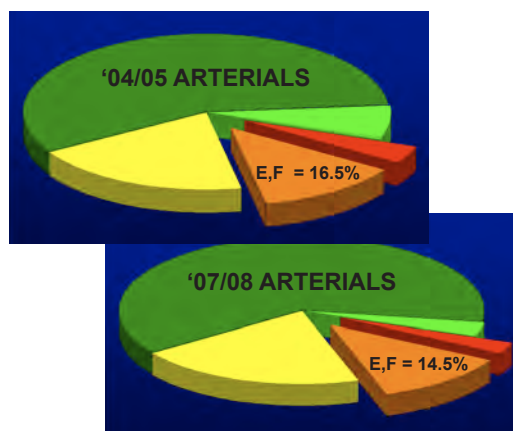


Figure 2.4 Arterial Congestion (Orange + Red) '04/05 vs. '07/08



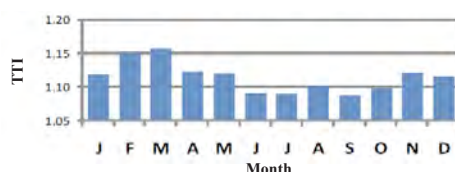
(Compiled from Skycomp aerial survey data based on the number of lane-miles operating at each LOS value for one hour between 6:30 and 9:30 a.m. and between 4:00 and 7:00 p.m.)

The contribution of completed projects on improved mobility ratings

There are two basic reasons why measures of system-wide congestion may have fallen: there was less overall demand placed on the system by the traveling public, and/or projects have been completed that were designed to mitigate congestion and improve traffic flow. Both explanations seem to apply here, as is discussed below. However, it is beyond the scope of this analysis to quantify the relative significance of each.

At first glance, it appears likely that demand has eased significantly, simply by viewing the VMT curve in *Figure 2.1*: the 2008 data point (while preliminary) shows the first significant drop in VMT (4.3%) since 1991. This helps to account for a small degree of the improvements measured during the '07/08 survey flights since the 2008 VMT drop largely took place after most survey flights had been completed. The freeways and some arterials had been surveyed back in the fall of 2007, and most of the remaining arterial highways were surveyed during March, April and May of 2008. According to a 2008 month-by-month travel-time-index profile prepared by INRIX (see *Figure 2.5*), travel times (and presumably demand, by extension) were improving but still remained relatively high March through May (by comparison, June through October had the fastest average travel times of the year). It is true that there was a period of steadily-rising gasoline prices between January and July of 2008 (from \$3.00 to \$4.00 per gallon) which may have helped to attenuate demand, but this could have had only a minor effect on the aerial survey findings; and likewise, the broad economic decline that accelerated later in the year occurred after most survey flights had been completed.

Figure 2.5 INRIX Travel Time Index by Month, 2008



(INRIX National Traffic Scorecard, 2008 Annual Report, p. A-9)

Figure 2.1 does suggest that demand may have eased prior to 2008, with VMT measures having leveled off between 2004 and 2007. The locally-calculated travel-time index in Figure 2.2 and the similar index from Inrix also suggest a leveling of demand prior to the decreases of 2008.

In the end, however, while these measures may point toward a leveling or slight easing of demand, they cannot provide insight about the degree to which those trends might have resulted from projects to restore or maintain mobility. Whatever the case, the fact is that many such projects were completed between the '04/05 and '07/08 survey periods, and significantly improved flow was found at many of these sites. For example, interchange improvements were made that eased congestion on SR 316 at I-85; short auxiliary travel lanes were added on I-575 north of SR 92 that provided clear benefits. An interchange improvement on I-75 south of the I-675 merge in Henry County may have helped to reduce evening congestion on I-75. On the arterial highway network, a number of bottlenecks were

Fig 2.6 Impact of SR 400 widening

	2005	2007	
	LOS F	LOS F	Percent
	(ln-mi-hrs)	(ln-mi-hrs)	Change
SR 400 only	238	161	-32.4%
Total FWY	1836	1596	-13.1%
FWY less SR 400	1598	1435	-10.2%

(Derived from Skycomp aerial survey data)

eliminated entirely by converting 2-lane highway sections into 4-lane sections, or by adding turning lanes at intersections. Efficiency improvements were also made, such as adding one-way streets through the McDonough town center. Although not directly verifiable through the aerial photography, signal timing improvements were reportedly made on many corridors throughout the region. The largest completed improvement project – widening of the most severely congested high-volume corridor in the region (SR 400) – directly accounted for about 3% of the total 13% drop of congestion on the freeway system (see *Figure 2.6*, left; 3% is the difference between the 13.1% improvement calculated overall vs. 10.2% improvement calculated if SR 400 data were excluded).

Beyond benefits that were directly evident, it can be presumed that indirect benefits from these projects were also realized: when drivers adjust their habits to take advantage of the newly improved routes, pressure is theoretically relieved on the routes they used to take, benefitting drivers still taking those routes. (In fact, this was apparently evident from the disappearance of congestion at the traffic signals on SR 9 through Alpharetta, a route that closely parallels the widened section of SR 400.) Altogether, it is reasonable to conclude that projects to improve capacity and efficiency accounted for a significant part of the 13% measured improvement.

Section 2.1: Sites with improved mobility

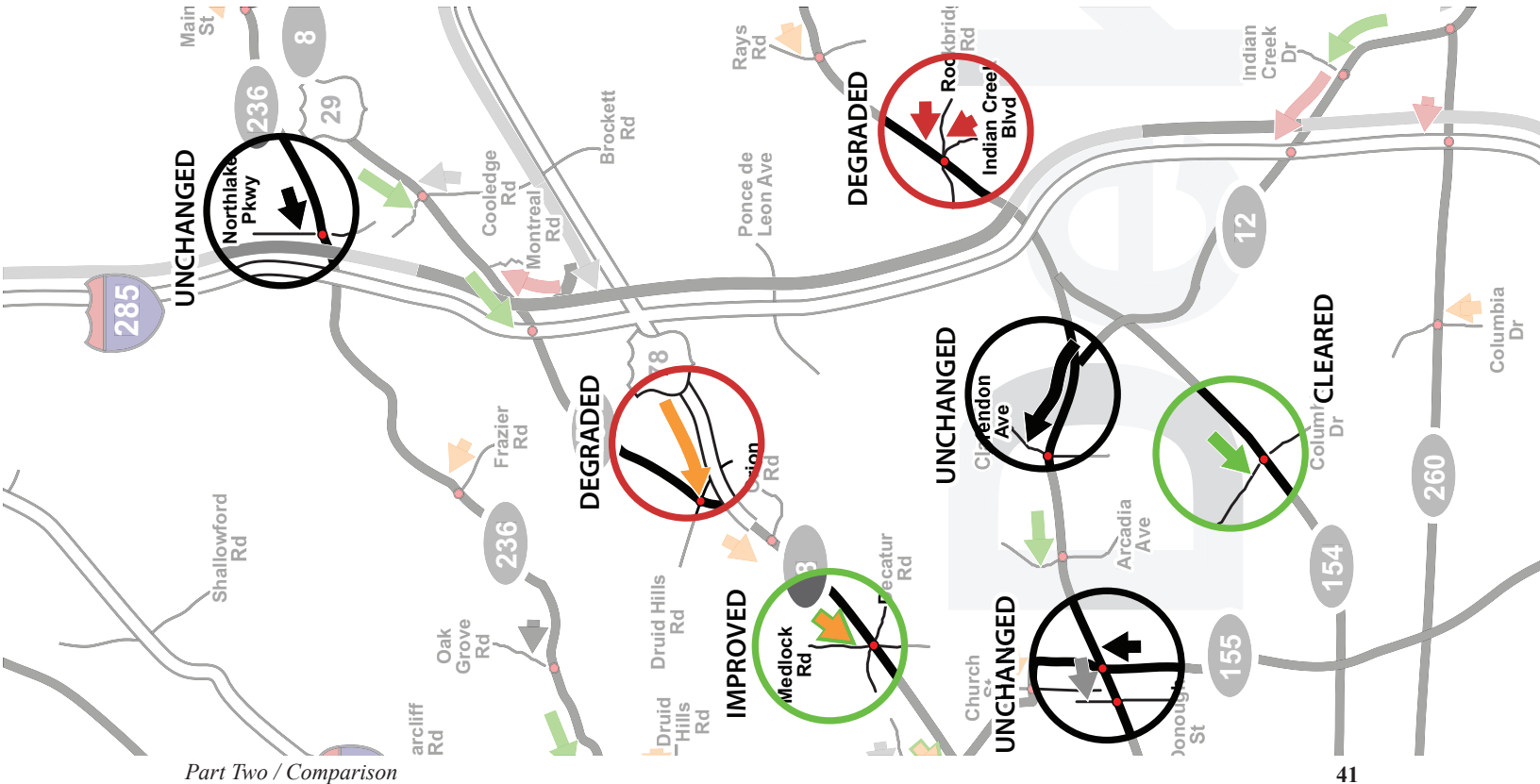
This section highlights many of the areas where significant mobility improvements were found on the system. In screening sites for this section, an attempt was made to identify changes that were largely confirmed during most or all of the 2007 / 2008 survey flights (minus the effects of confirmed or suspected incidents). Although logical reasons could not be found for all apparent changes, and although daily variations undoubtedly played a role in some cases, the objective was to report significant findings regardless of whether logical apparent causes could be identified.

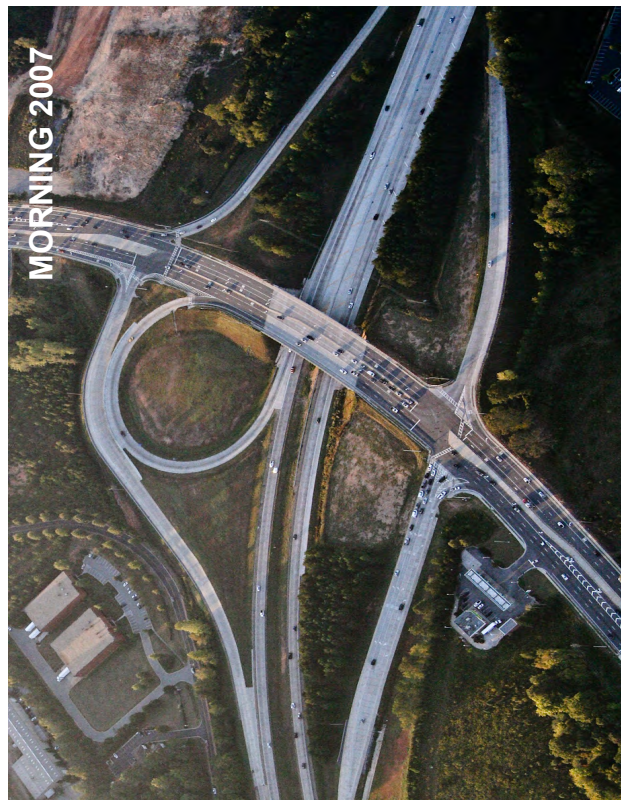
INTERPRETING THE NEW MAP FORMAT IN PART TWO

The bottleneck maps presented in Part One have been converted to "Comparative Maps" for Part Two. These maps have been modified to highlight exactly where significant changes have been found on the network, between 2004/05 and 2007/08. The comparative maps differ from the Part One bottleneck maps in that many red and orange arrows -- those that depict where congestion has NOT significantly changed -- have been switched to less prominent black and gray. Bright colors (red, orange and green) have been used to highlight ONLY where the significant changes were found:

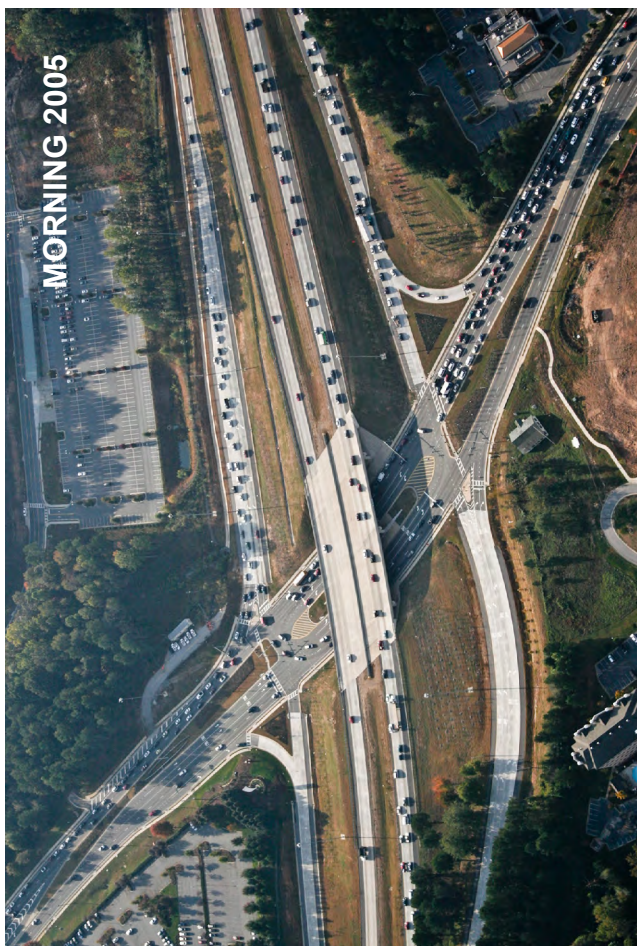
- 1) RED depicts severe congestion that was not necessarily new but significantly degraded;
- 2) ORANGE depicts minor or intermittent congestion that was not found previously.
- 3) GREEN arrows have been added to depict where previous congestion was no longer found.
- 4) Lastly, a special symbol was needed where previously-severe congestion was partially mitigated to less-severe levels; ORANGE arrows with GREEN BORDERS were used in these situations.

The map cut-out to the left has examples of all of these types of arrows.



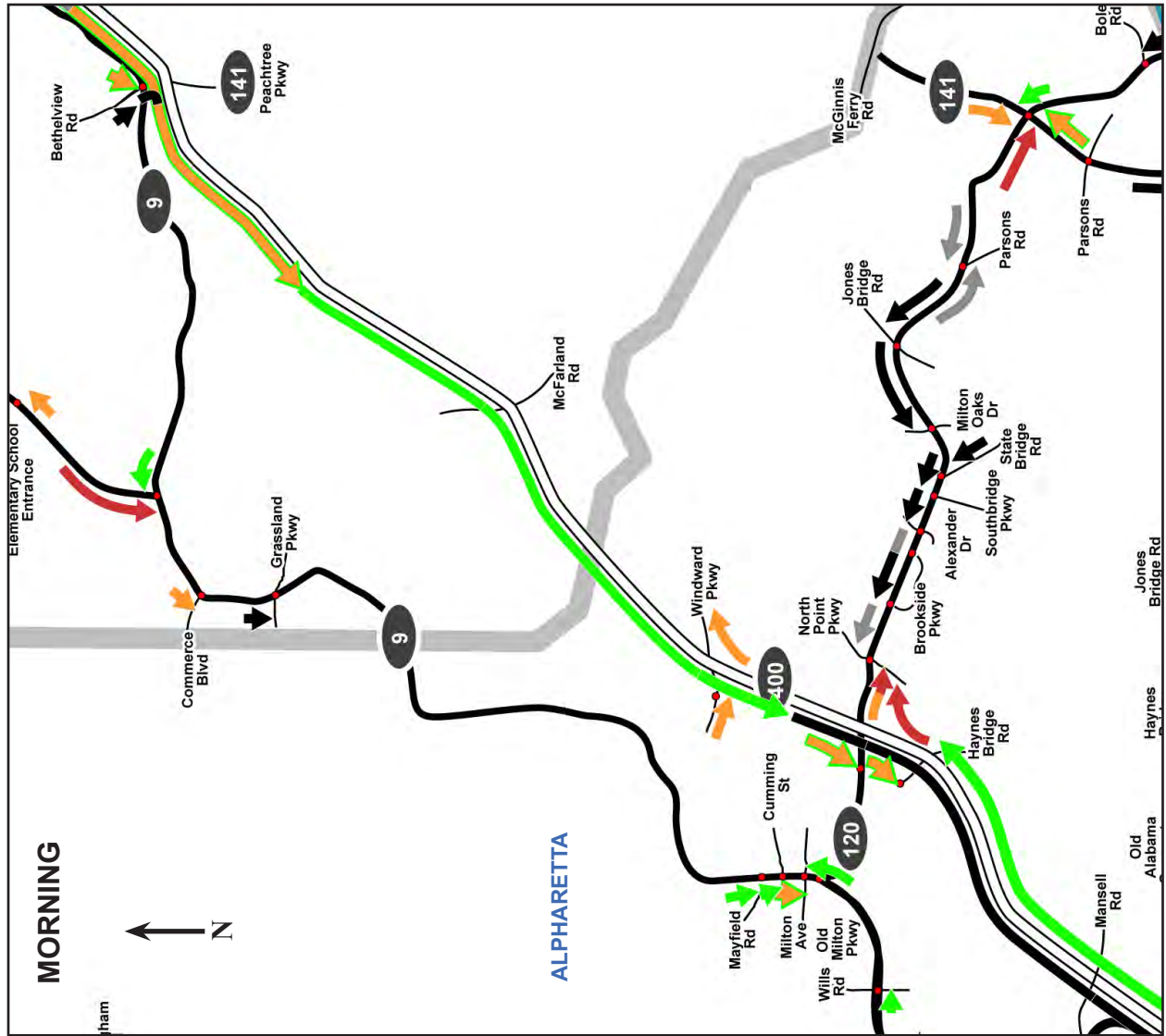


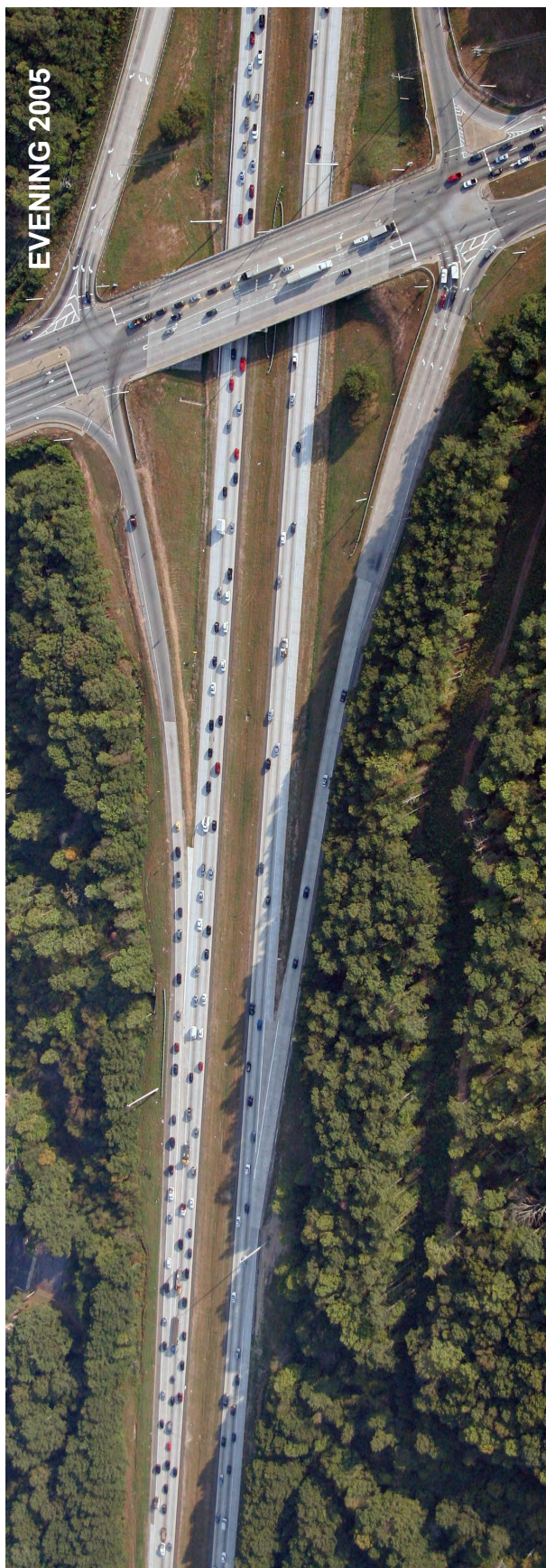
2005 photos (top) and 2007 photos (bottom) of adjacent interchanges on SR 400; McFarland Road is on the left; Windward Parkway is on the right. Congested vehicles on SR 400 shown in the 2005 photos are heading southbound toward Roswell and I-285.



FREeway IMPROVEMENT (PROJECT): SR 400 in Forsyth and northern Fulton Counties, Morning

SR 400, rated as the most severely congested corridor in the 2005 Mobility Assessment Report, was recently widened for a distance of nine miles, between McFarland Road in Forsyth County and Holcomb Bridge Rd (SR 140) in Roswell. With this widening, drivers were afforded 4 lanes each way between interchanges (and 3 through the interchanges) for the entire distance between McFarland Rd and SR 140. For the 24 mile drive between SR 20 to the north and I-285 to the south, the estimated morning travel time improved from 58 minutes during the 2005 survey flights to 42 minutes in 2007; overall southbound delays were cut almost in half, from 34 minutes to 18 minutes (assuming a 24 minute travel time in uncongested conditions at 60 mph). Additionally, northbound congestion between SR 140 and SR 120 was entirely relieved. It appears also that this improvement has relieved pressure on SR 9 through Alpharetta, where significant queues were no longer found at the mainline traffic signals.

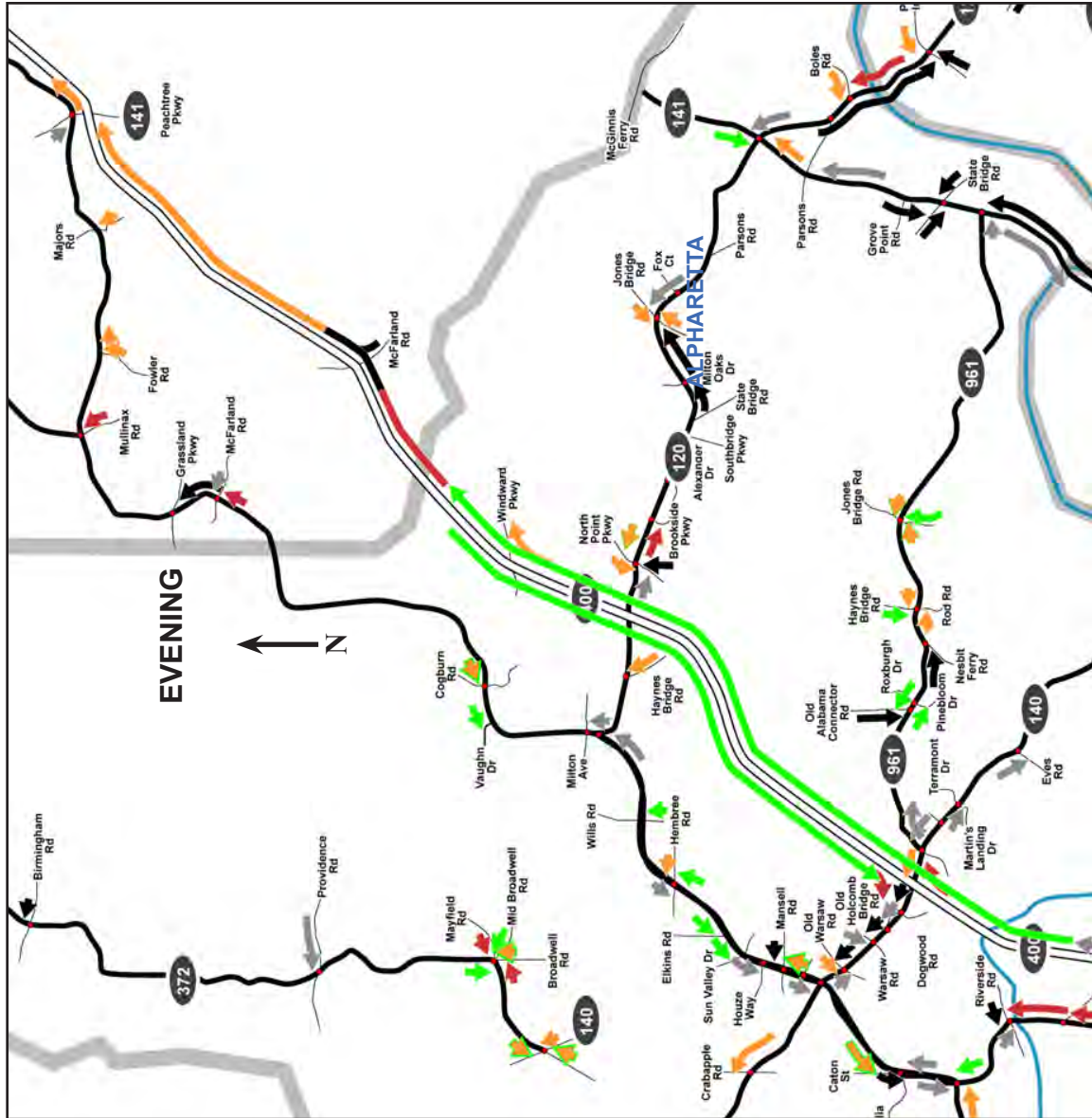


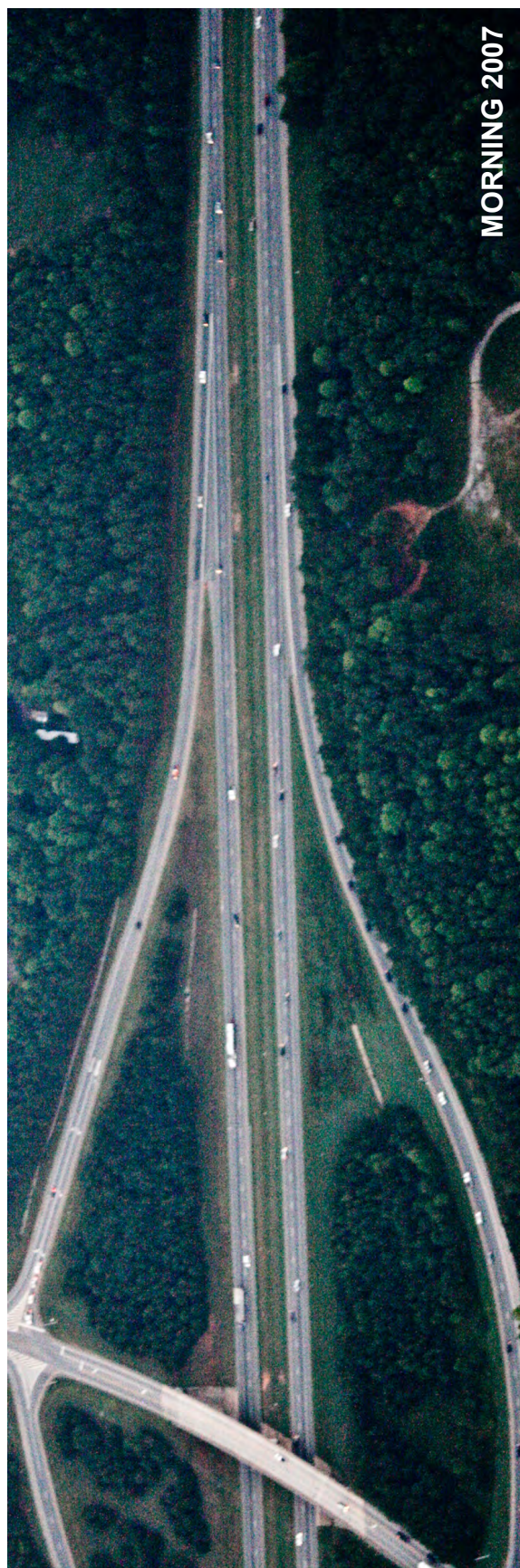
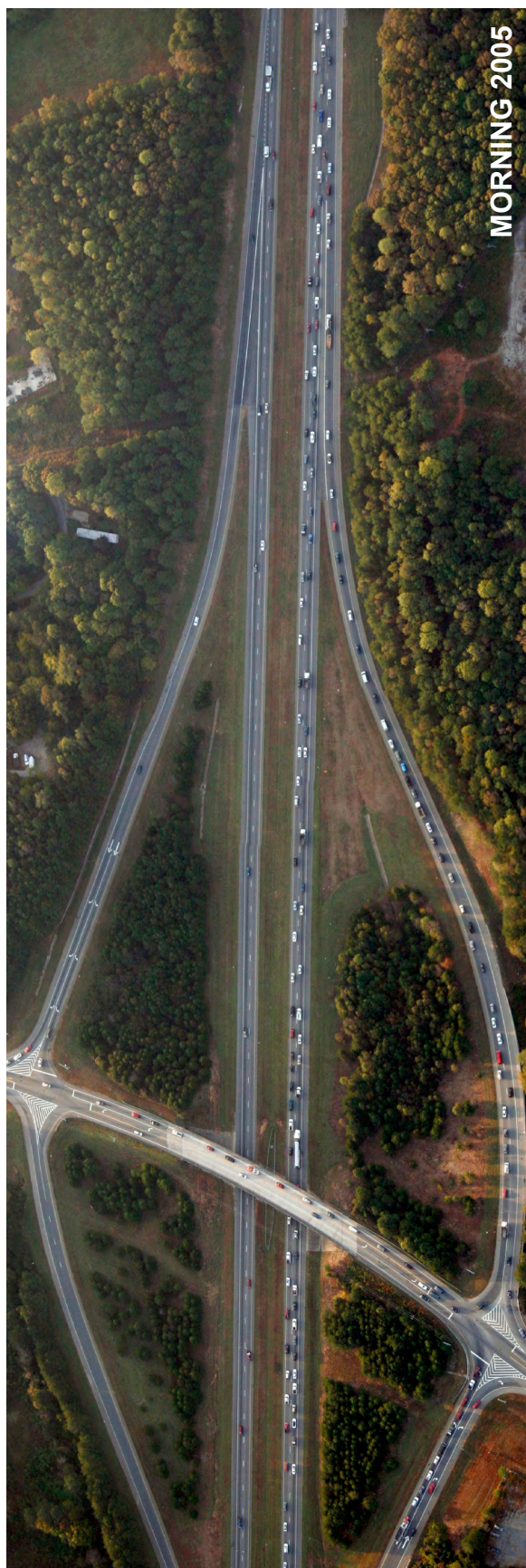


Two views are shown of SR 400 at SR 120 (Old Milton Parkway, with 2005 on top and 2007 on the bottom; northbound is to the left. In 2005, not only was congestion found in the peak northbound direction, but less severe congestion was found in stretches in the southbound direction (some evidence of this is visible on the left side of the upper photo, where vehicles are flowing at speeds well below free-flow). These photos clearly show how the median grass strip was used to provide space for the new travel lanes.

FREEWAY IMPROVEMENT (PROJECT): SR 400 in Forsyth and northern Fulton Counties, Evening

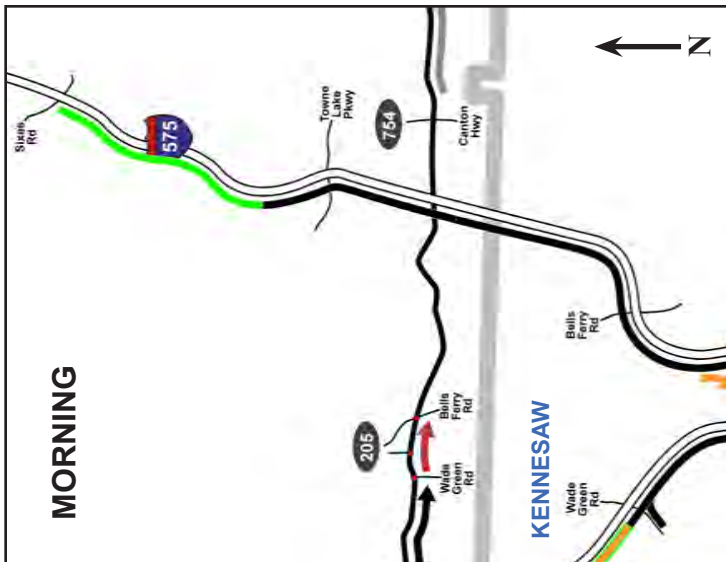
As discussed on the previous page, SR 400 was widened to four lanes (three through the interchanges) prior to the start of the 2007 freeway survey flights, between Holcomb Bridge Road (SR 140) to the south and McFarland Road to the north. This improvement has eliminated virtually all evening congestion between the Chattahoochee River and the Windward Parkway interchange, in both directions. (Note, however, that greater delays are now encountered approaching the lane drops from four lanes to two lanes at McFarland Road; minor delays are also found now north of McFarland Rd, approaching the SR 141 interchange.) Again as found during the morning peak period, this improvement appears to have relieved pressure on SR 9 though Alpharetta, as congestion was no longer found at several mainline traffic signals through town.





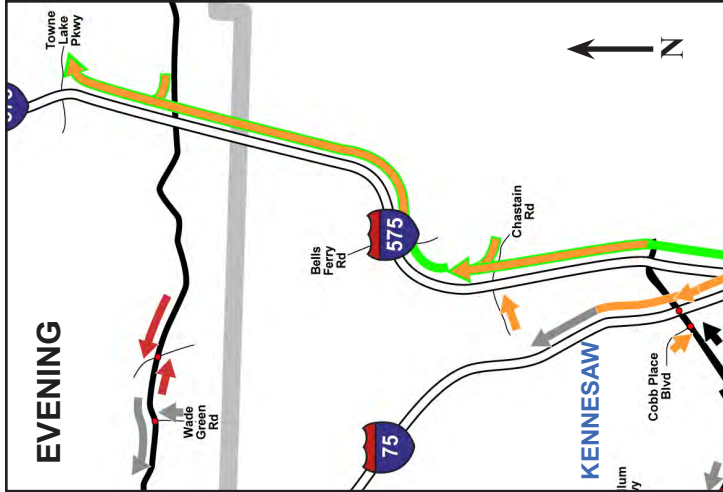
Above: In 2005 the tail of the southbound queue on I-575 was typically encountered at the Sixes Road interchange (as shown in the top photo), or shortly beyond. During the 2007 survey flights, vehicles traveled at normal highway speeds until reaching the tail of the queue a short distance north of the Towne Lake Parkway interchange. Congestion was not found close to the Sixes Road interchange during any observation, as shown in the bottom photo.

FREEWAY IMPROVEMENT (PROJECT): I-575 in Cherokee County



MORNING

EVENING



Between the 2005 and 2007 survey periods, an auxiliary travel lane was added in both directions to I-575 between Towne Lake Parkway and SR 92. This reduced merging while allowing local traffic from Towne Lake Parkway to use I-575 to traverse to SR 92 without needing to merge into the primary three travel lanes.

During the morning peak travel period, this helps accounts for why the tail of the southbound queue was encountered much closer to the Towne Lake Parkway interchange in 2007 than in 2005 (when the tail was encountered as far north as Sixes Road, as shown in the top photo on the opposite page).

During the evening period, this improvement helped to preclude congestion from forming at the SR 92 merge (see photos below); this helps to account for the reduced level of northbound congestion found on I-575 during the evening period.

EVENING 2005



EVENING 2007



These photos (2005 on top, 2007 on bottom) show I-575 at the SR 92 interchange merge; northbound flow is to the left. Note that 2007 traffic on the bottom photo is not required to merge into two lanes as before, eliminating a bottleneck that historically extended several miles upstream (to the south).

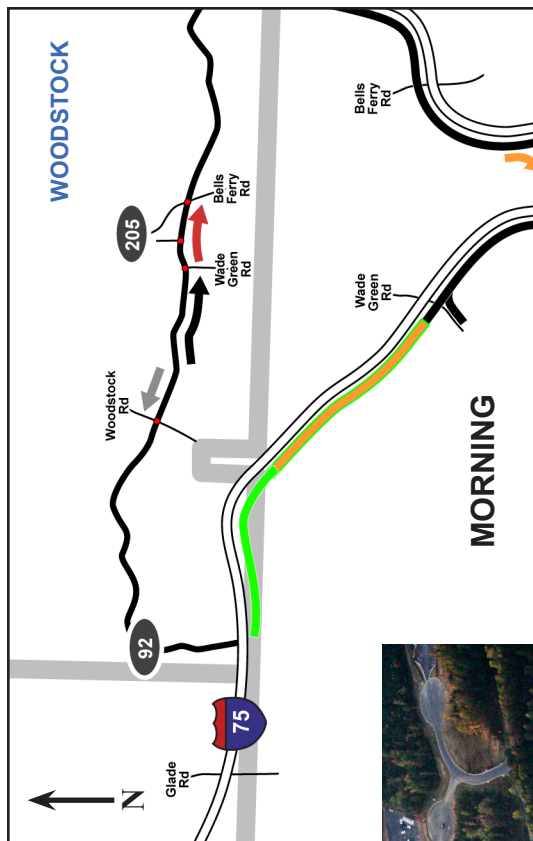
FREEWAY IMPROVEMENT (CONSTRUCTION ZONE): I-75 in Cobb and Cherokee Counties, Morning

(Photos below) Congested southbound flow in 2005 is shown on I-75 during the morning period, at a point about one mile south of the SR 92 interchange. Congestion did not extend back to this point during any of the 2007 survey flights, as supported in the lower photo.

2005



2007

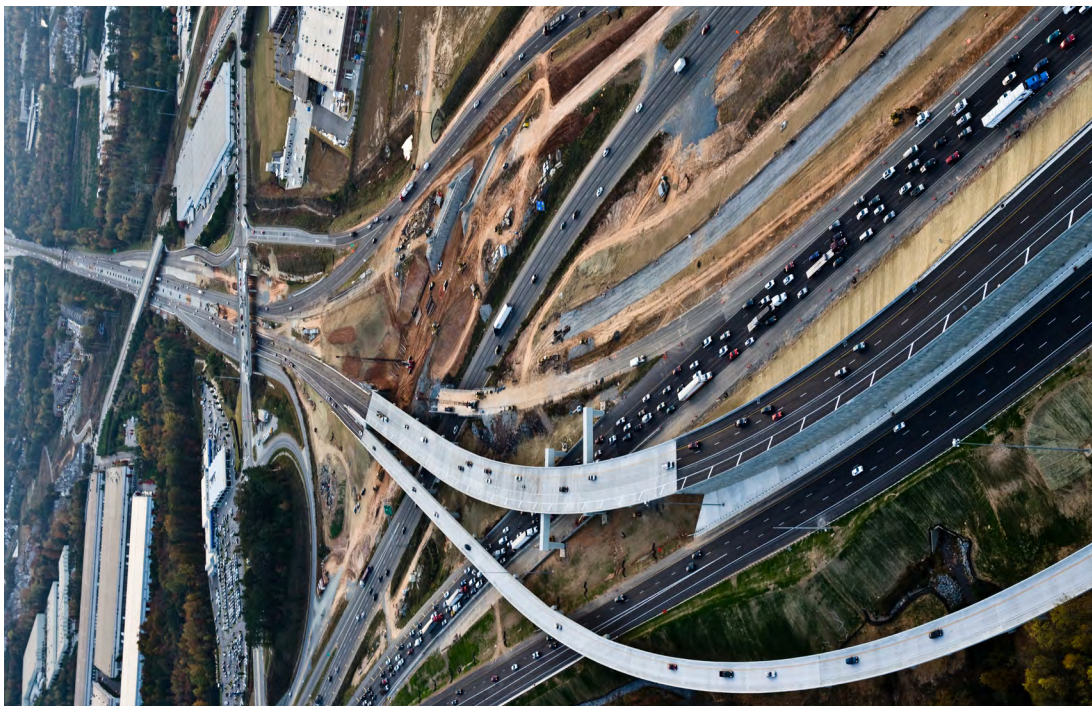


Construction to widen and rehabilitate I-75 was ongoing throughout the fall 2007 survey flights of the freeway system, between SR 92 and Barrett Parkway; nevertheless, three travel lanes were maintained at all times, so the same number of lanes were available as during the 2005 survey flights.

Despite the construction, mobility levels in 2007 were measured at slightly better levels than in 2005; the tail of the queue was still encountered north of Wade Green Road, but it did not extend most of the way to SR 92 as it typically did during the 2005 survey flights. Once drivers encountered the tail of the queue, congestion severity in 2007 was comparable to 2005.

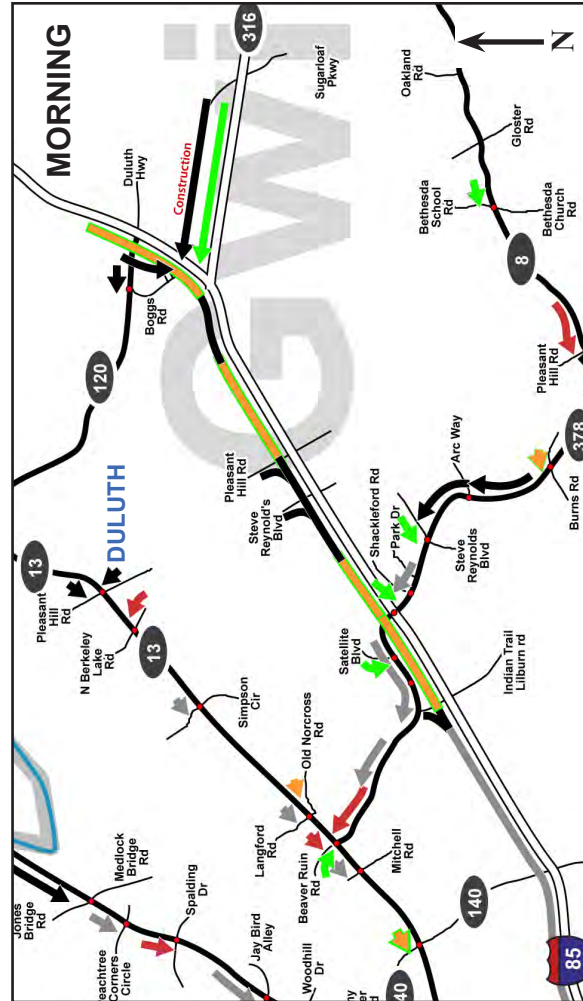
It is probable that this apparent improvement was due to normal daily variation of tail lengths, which commonly occurs at the beginning of long, congested zones on heavily traveled freeways. Still, other unidentified factors may have affected driver demand for I-75 during the survey period. (The signalized intersections along the parallel route through Kennesaw (SR 3 / US 41) was congested at the same severe levels in 2007 as in 2005.)

FREEWAY IMPROVEMENT (PROJECT): SR 316 at I-85 in Gwinnet County, Morning



This is a view of the terminus of SR 316 at I-85, looking northeast along SR 316. The new flyover ramp to the left now provides direct access to the southbound I-85 service road, allowing SR 316 traffic to bypass the mainline of I-85.

While fall 2007 survey flights were being conducted, construction to widen and rehabilitate I-85 between SR 316 and Pleasant Hill Road was ongoing. In general, the same number of travel lanes were maintained on I-85 as were available pre-construction. A major difference, however, was that just one lane was temporarily available connecting SR 316 to southbound I-85 during the early survey flights. The normal number of lanes (2) was restored during the later survey flights, but a new one-lane ramp was also opened. This gave SR 316 drivers the option to “fly over” mainline I-85 and access the southbound service road directly. Thus it is likely that SR 316 supplied traffic at a lower rate to the southbound I-85 mainline than pre-construction. This may help to account for the lower traffic densities (and presumed higher average travel speeds) found on the I-85 mainline during the morning 2007 survey flights.



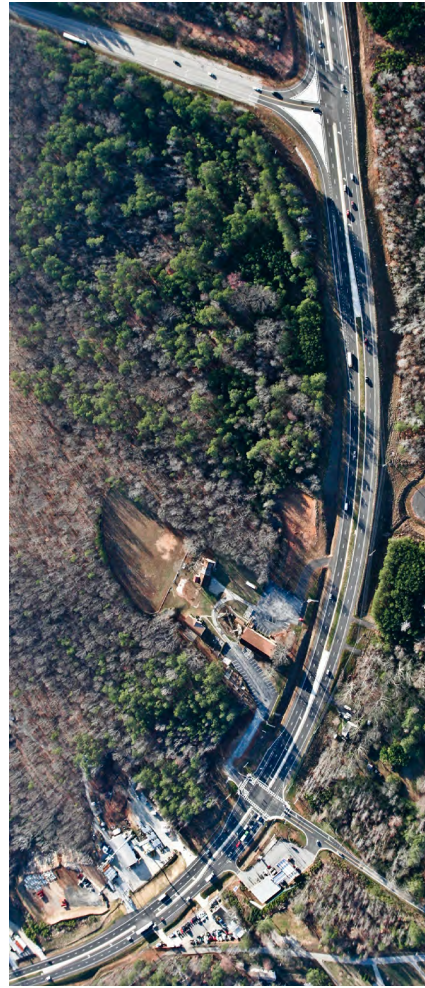
ARTERIAL IMPROVEMENT (PROJECT): SR 92 (Fairburn Rd) **in Douglas County, Morning**

Prior to the 2008 survey, SR 92 (Fairburn Rd) was widened to a 4-lane highway for a length of two miles, between Lee Rd and where Fairburn Rd joins SR 166. This eliminated a significant one-lane bottleneck on an approach route that carries traffic toward either of two bridges across the Chattahoochee River.

2004



2008



Morning photos in 2004 and 2008 of SR 92 (Fairburn Rd) approaching the split at SR 166 in Douglasville; the Chattahoochee River is to the right.



ARTERIAL IMPROVEMENT (PROJECT): SR 54 in Coweta and Fayette Counties, Morning

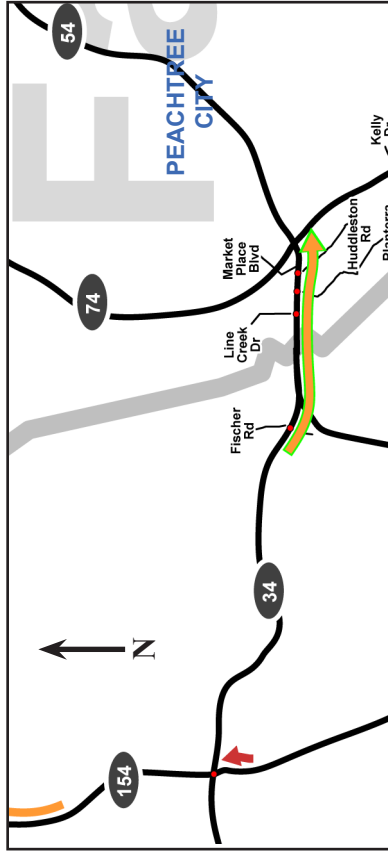
2004



2008



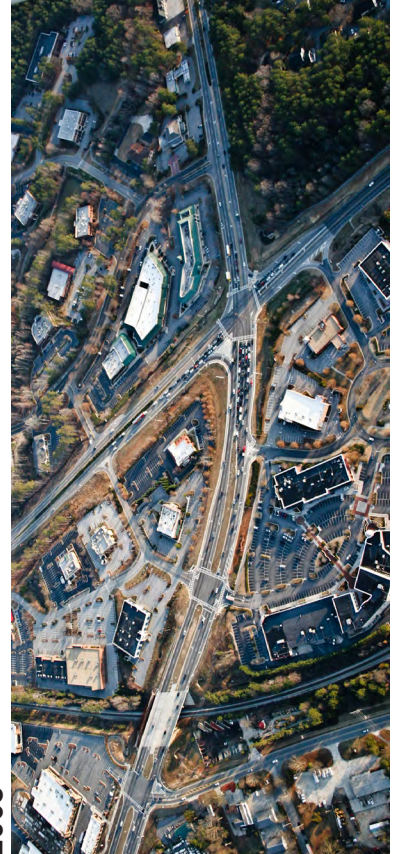
These two pairs of before-and-after photos of SR 54 approaching Peachtree City from the west show the west and east ends of a congested zone that was mitigated by a widening project (2008 traffic was heavy but significant delays were eliminated). Note in the photos to the right that the railroad bridge in town was also widened.

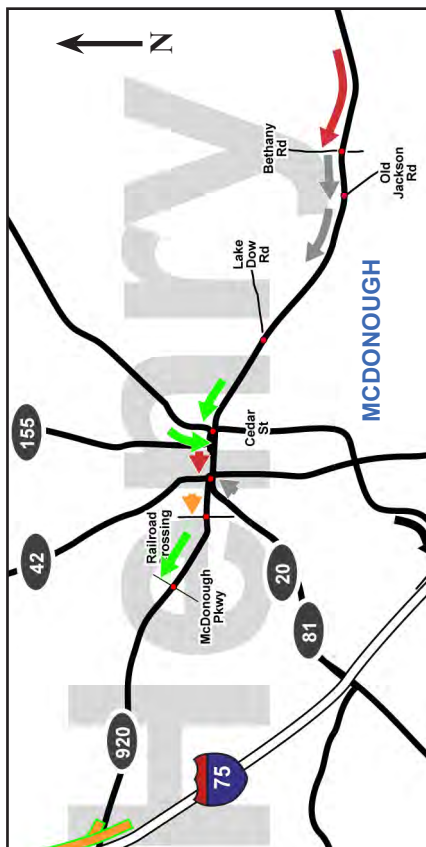


2004



2008





MORNING

ARTERIAL IMPROVEMENTS (PROJECTS): SR 920, SR 42 and SR 81 through downtown McDonough in Henry County, Morning and Evening



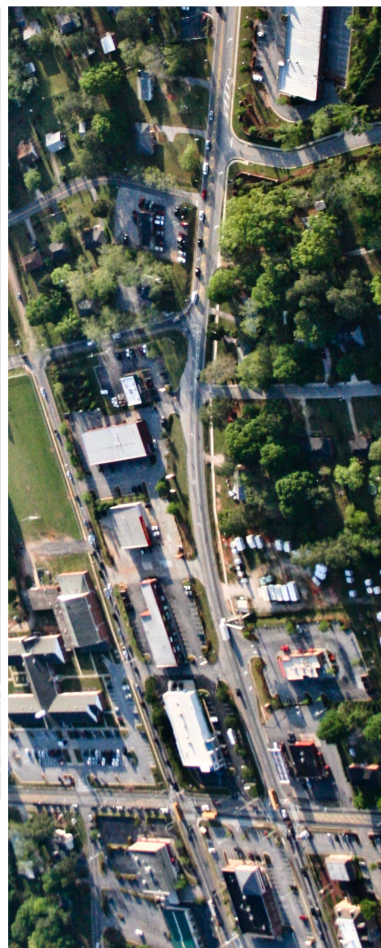
2004

2008

(Below, morning) This pair of photos shows SR 920 (Jonesboro Rd) at McDonough Parkway. The top photo shows a westbound queue typically found in 2004. The bottom photo shows the configuration of the highway in 2008.



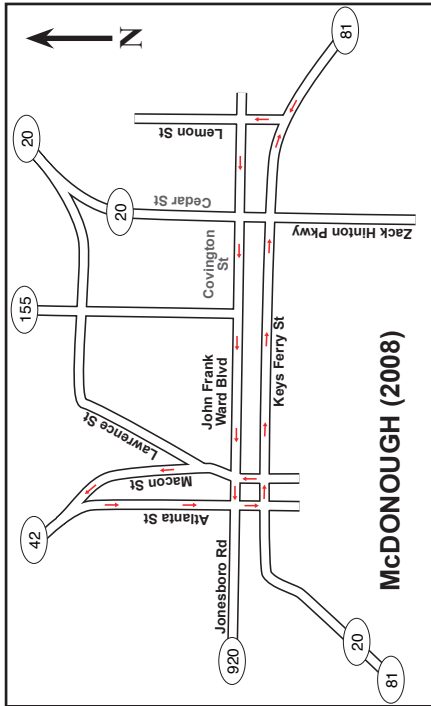
2004



(Above, morning) The top photo shows the westbound queue typically found on Keys Ferry St in 2004. The reconfigured approach is shown in the bottom photo in 2008, with Keys Ferry now eastbound-only. Traffic is routed north on Lemon St (see map), and then west on John Frank Ward Blvd (formerly Covington St.)



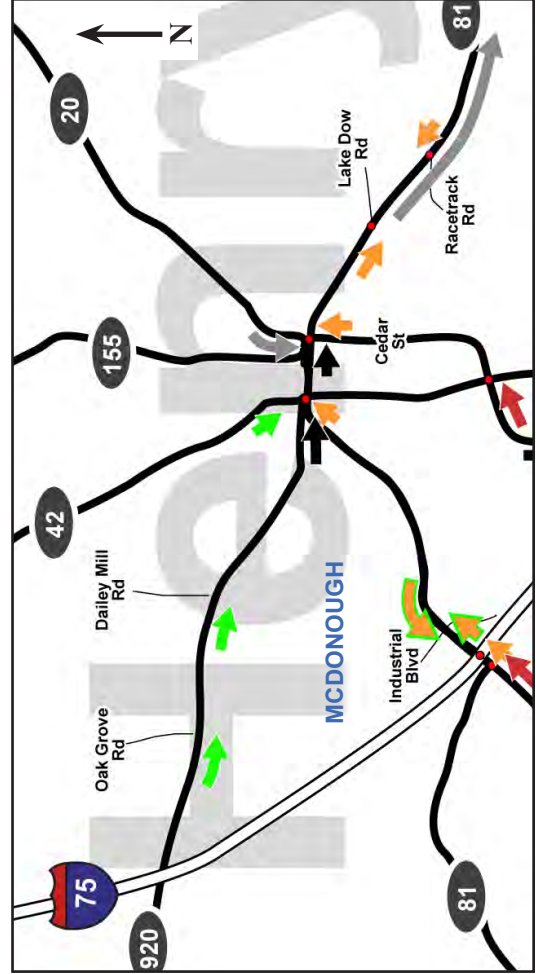
2008



(Morning and Evening) In Henry County, efficiency and capacity changes were made on several routes approaching and crossing through downtown McDonough. Westbound traffic on SR 81 was permanently shifted one block north to Covington St (now John Frank Ward Blvd), which was re-designated one-way; this eliminated a morning westbound queue previously found on Keys Ferry St. at Cedar St. (now Zach Hinton Pkwy); and it removed an intermittent southbound queue entering town on SR 20 from the north. Next, a quarter-mile section of new roadway was built to the north of the town square, one block east of the original SR 42 right-of-way, to allow the reconfiguration of SR 42 into one-way sections into and out of town. Lastly, to the west of the central business district, SR 920 (Jonesboro Rd) was widened from 2 to 4 lanes. This also eliminated intermittent delays at several signals between downtown McDonough and the interchange at I-75.

(Left, evening) This photo, oriented with north to the top, shows the new northbound link of SR 42 (Macon St / see map) built so that the original right-of-way (Atlanta St) could be converted to one-way southbound.

EVENING



ARTERIAL IMPROVEMENT (PROJECT): SR 20 at Cowan Rd in Rockdale County, Evening

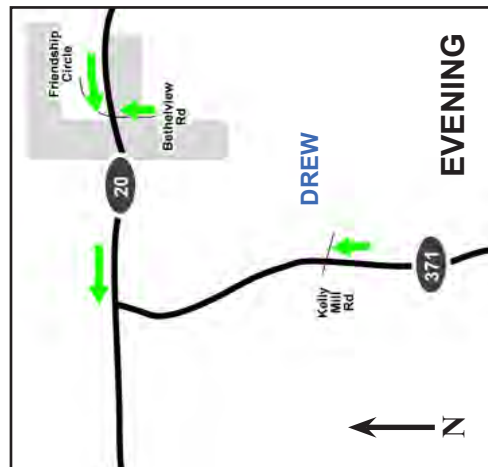


2004



(Above) This 2004 photo shows construction of intersection improvements that eliminated a rural bottleneck (SR 20 at Cowan Rd).

ARTERIAL IMPROVEMENT (PROJECT): SR 371 in Forsyth County, Evening



2004



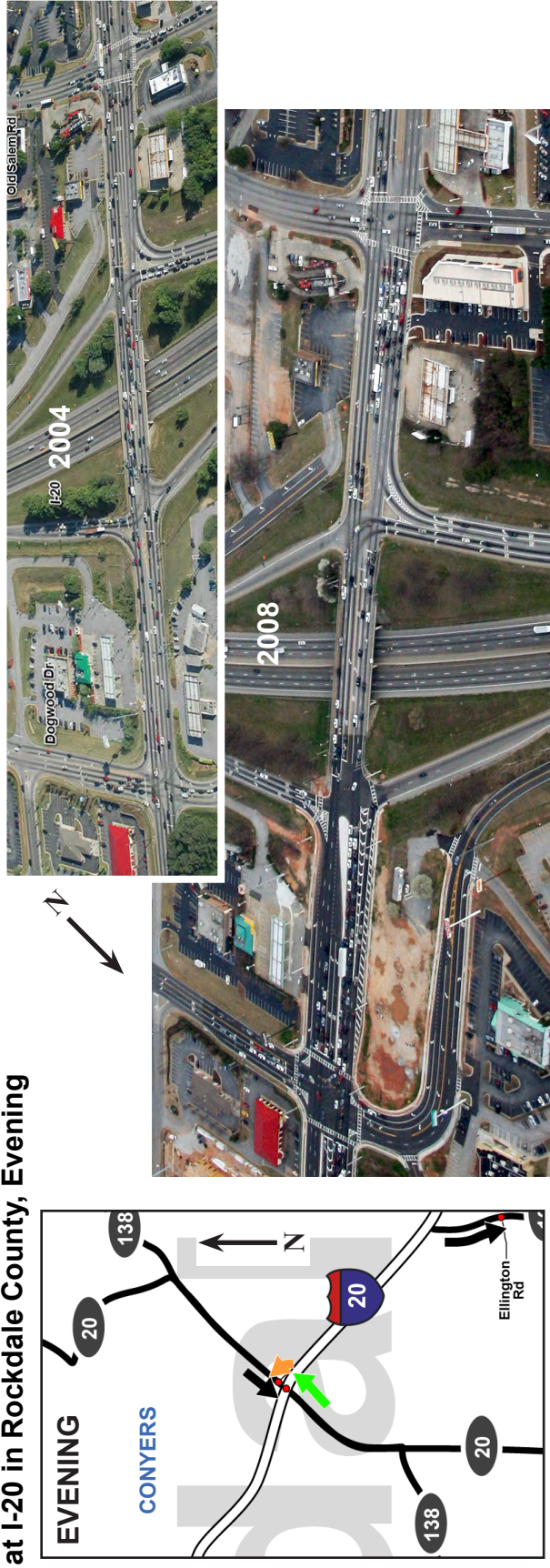
(Below) This pair of photos show similar intersection improvements to eliminate another rural bottleneck (SR 371 at Kelly Mill Rd).

2008



ARTERIAL IMPROVEMENT (PROJECT): SR 138 / SR 20 **at I-20 in Rockdale County, Evening**

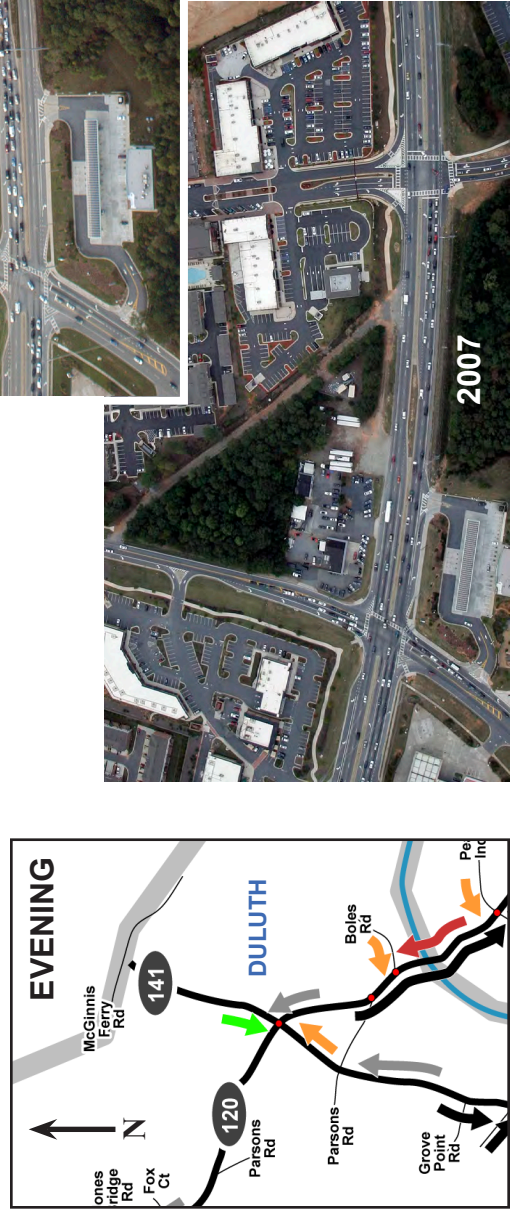
(Below, looking southeast along I-20) Widening of SR 138 / SR 20 eased northeast-bound congestion across the I-20 interchange.



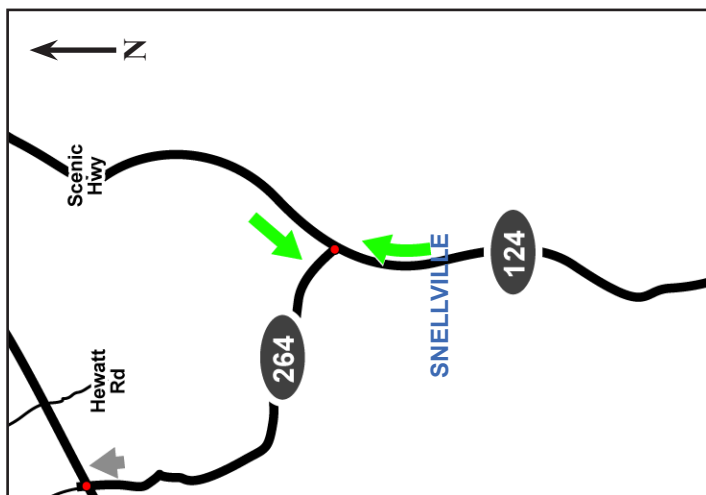
ARTERIAL IMPROVEMENT (PROJECT): SR 141 at **Bell Rd in Fulton County, Evening**



(Above and left) Realignment of Bell Road for a new development and the related construction of a new signalized intersection eliminated the left-turning southbound congestion shown in this 2005 photo.



ARTERIAL IMPROVEMENT (PROJECT): SR 124 at SR 264 in Gwinnet County, Morning

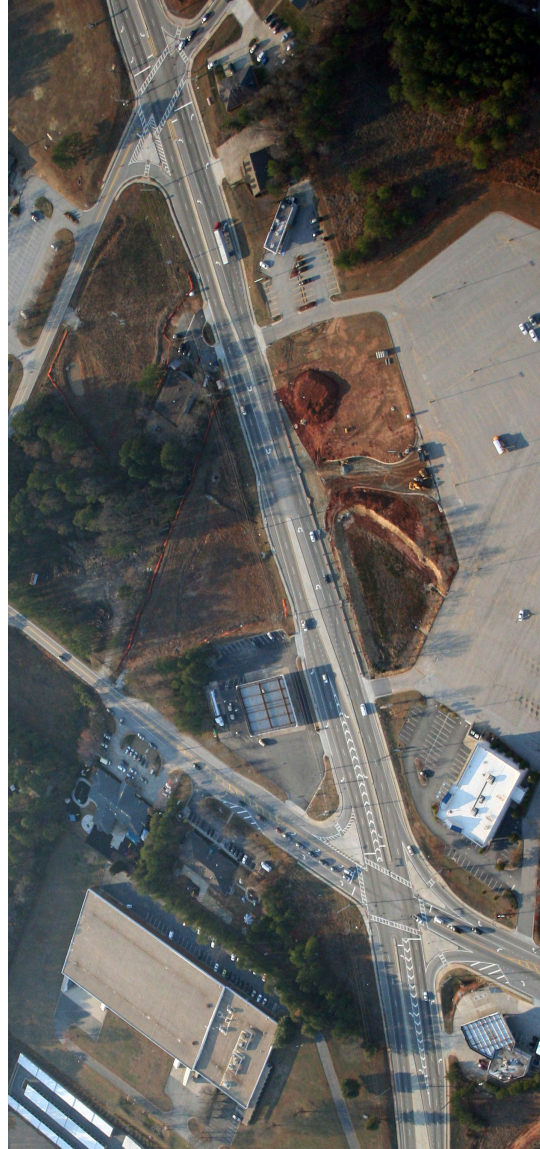


SR 124 was widened between Henry Clower Blvd to the north in Snellville and SR 264 (Annistown Rd) to the south; this segment was converted from two to four lanes for a length of four miles. This widening eliminated congestion found in 2004 in both directions at SR 264.

2004

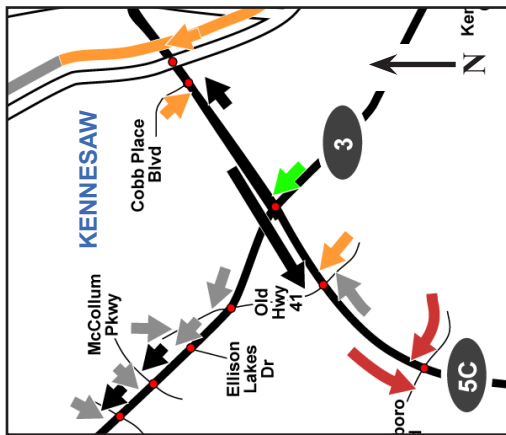


2008



(Above) The congestion in the 2004 photo (top) was northbound at SR 264 (Annistown Rd). Note that construction related to the widening project had already begun.

ARTERIAL IMPROVEMENT (PROJECT): SR 3 at SR 5C in Cobb County, Evening



2004

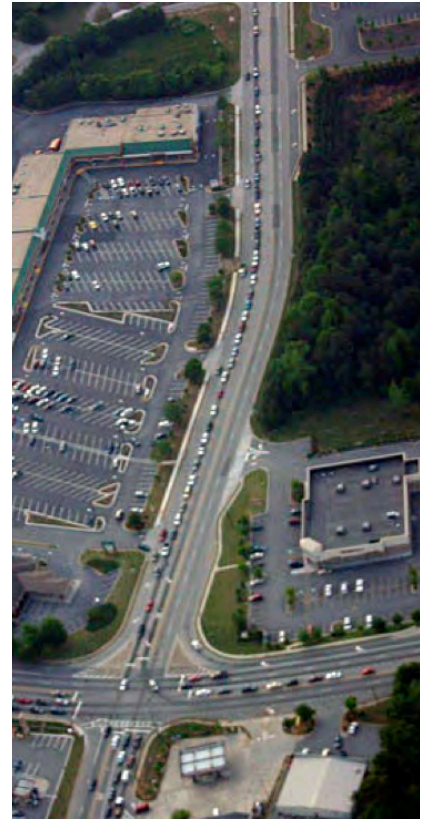


2008

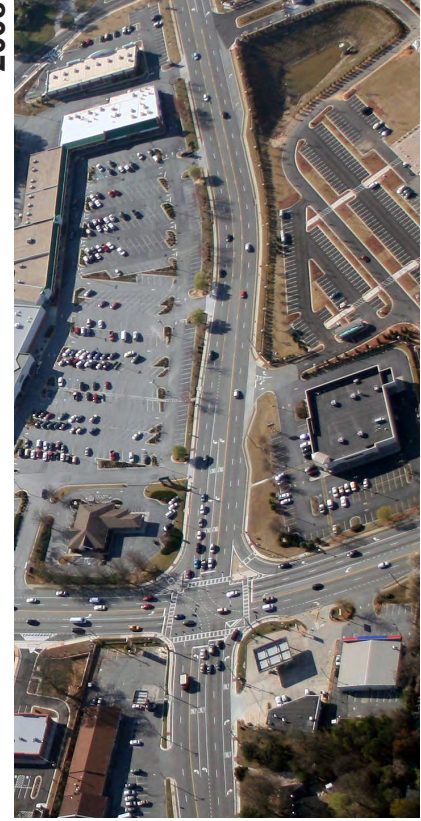


(Above and right) Westbound congestion on SR 3 (Cobb Parkway) at SR 5C was eliminated between the 2004 and 2008 by reconfiguring the intersection, lengthening the turning bays and (presumably) retiming the signals.

ARTERIAL IMPROVEMENT (PROJECT): SR 8 at Rockbridge Rd in Gwinnett, Evening



2004

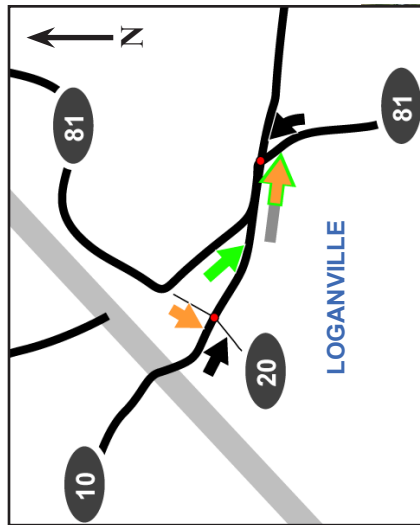


2008

(Above) Reconfiguration of the SR 81 intersection at Rockbridge Rd to provide two straight thru-lanes eliminated this bottleneck found in 2004.

ARTERIAL IMPROVEMENT (PROJECT): SR 10 at SR 81 in Walton County, Evening

Apparently in anticipation of construction of a new retail shopping center along the adjacent property, SR 10 in Loganville was widened and turning lanes were added in the eastbound direction between SR 20 and SR 81. When the 2008 photo below was taken, the right lane was still coned off. Nevertheless, queues were less significant than in 2004, and it appeared likely that they would no longer form when all lanes were open.



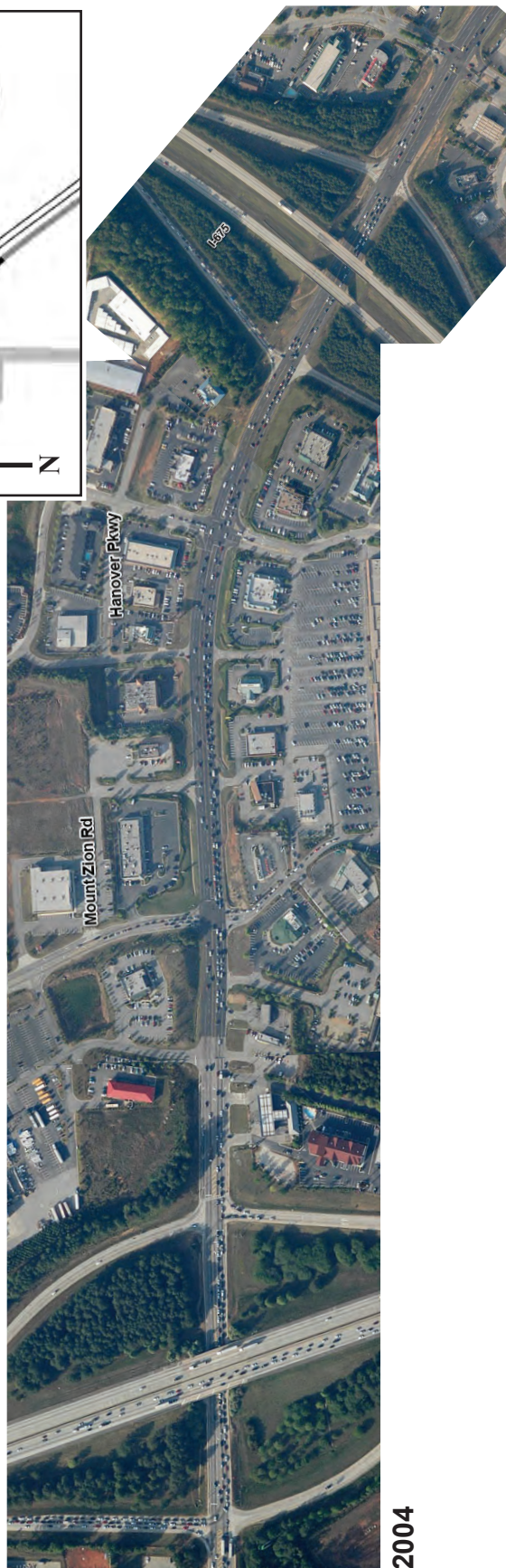
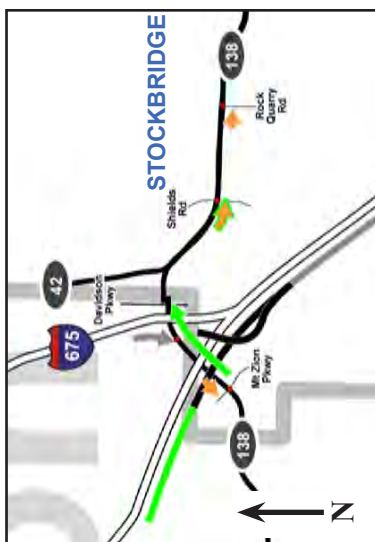
2004



2008

ARTERIAL IMPROVEMENT (UNVERIFIED REASON): SR 138 between I-75 and I-675, eastbound across the Clayton / Henry County boundary, Evening

In 2004, SR 138 was severely congested in the eastbound direction between the I-75 and I-675 interchanges. There were no indications of such congestion during the 2008 survey flights. The reason for this improvement has not been identified; however, because the queues were consistent with what might be expected with adverse signal timing, and because there were no visible changes to the infrastructure in 2008, it appears possible that retiming the signals may have corrected the problem.



2004



2008



SITES WITH DEGRADED MOBILITY

(Congestion
on SR 155 in
Henry County
(McDonough)
approaching
Industrial
Parkway)

Section 2.2: Sites with degraded mobility

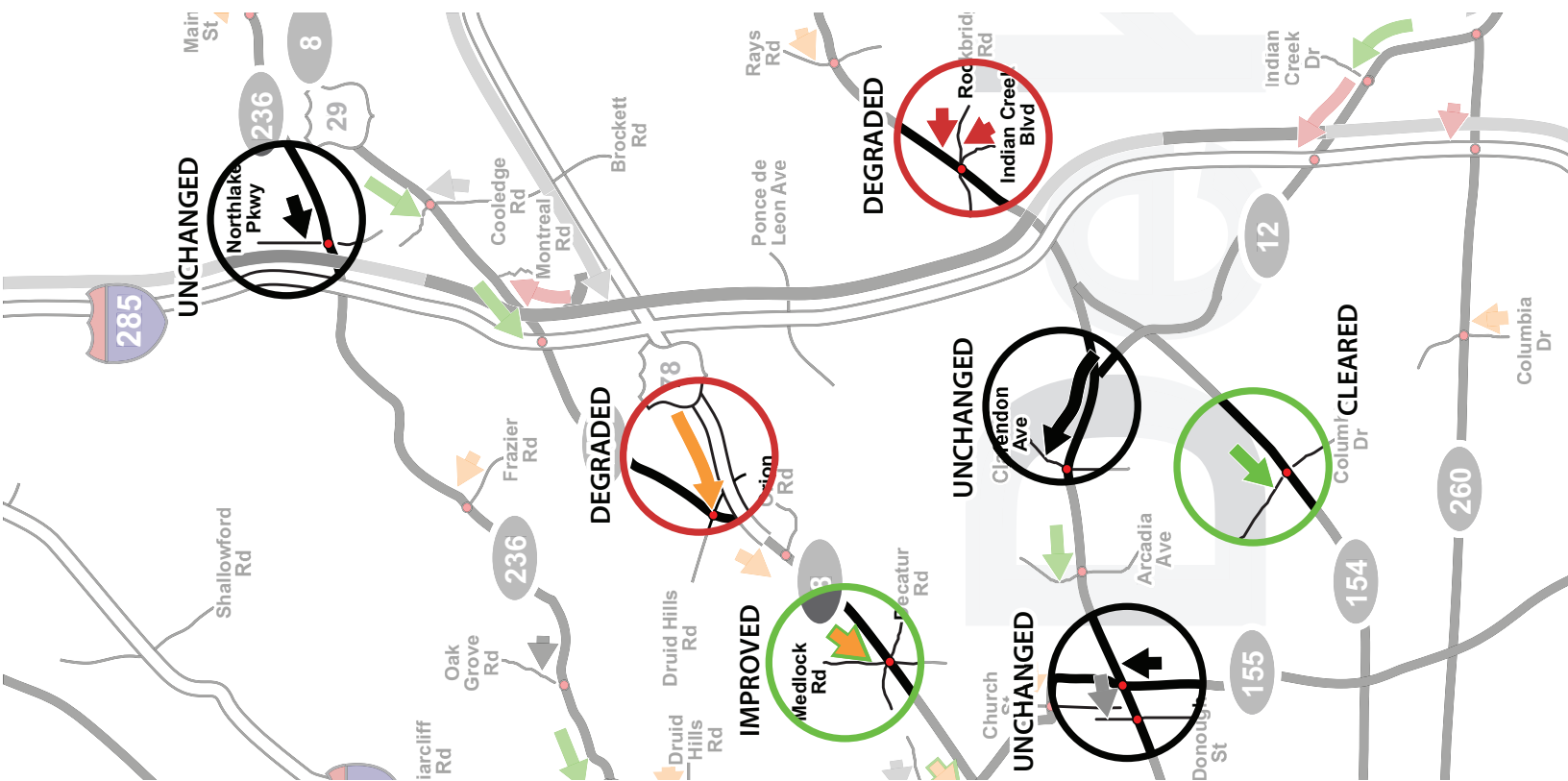
This section highlights many of the areas where significant mobility degradations were found on the system. In screening sites for this section, an attempt was made to identify changes that were largely confirmed during most or all of the 2007 / 2008 survey flights (minus the effects of confirmed or suspected incidents). Although logical reasons could not be found for all apparent changes, and although daily variations undoubtedly played a role in some cases, the objective was to report significant findings regardless of whether logical apparent causes could be identified.

INTERPRETING THE NEW MAP FORMAT IN PART TWO

The bottleneck maps presented in Part One have been converted to "Comparative Maps" for Part Two. These maps have been modified to highlight exactly where significant changes have been found on the network, between 2004/05 and 2007/08. The comparative maps differ from the Part One bottleneck maps in that many red and orange arrows -- those that depict where congestion has NOT significantly changed -- have been switched to less prominent black and gray. Bright colors (red, orange and green) have been used to highlight ONLY where the significant changes were found:

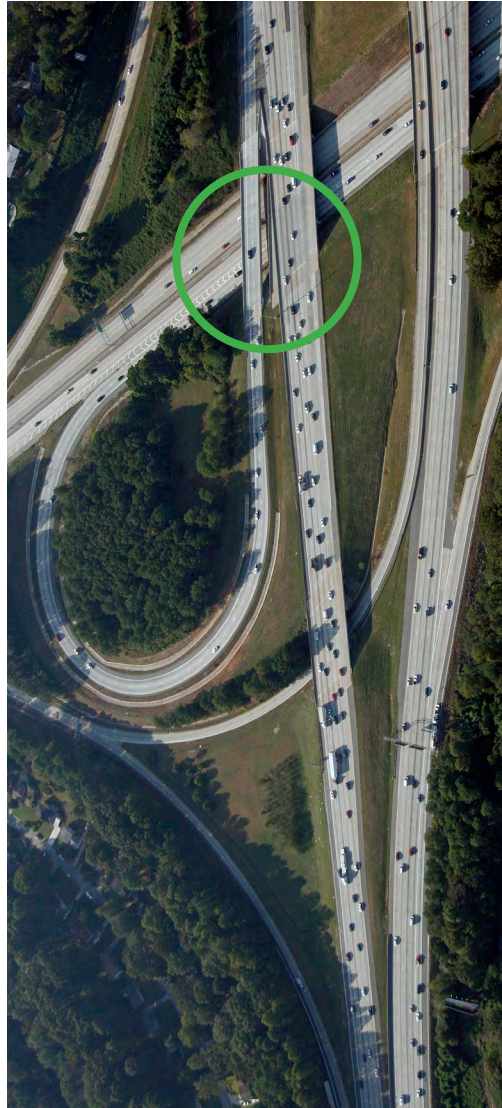
- 1) RED depicts severe congestion that was not necessarily new but significantly degraded;
- 2) ORANGE depicts minor or intermittent congestion that was not found previously.
- 3) GREEN arrows have been added to depict where previous congestion was no longer found.
- 4) Lastly, a special symbol was needed where previously-severe congestion was partially mitigated to less-severe levels; ORANGE arrows with GREEN BORDERS were used in these situations.

The map cut-out to the left has examples of all of these types of arrows.



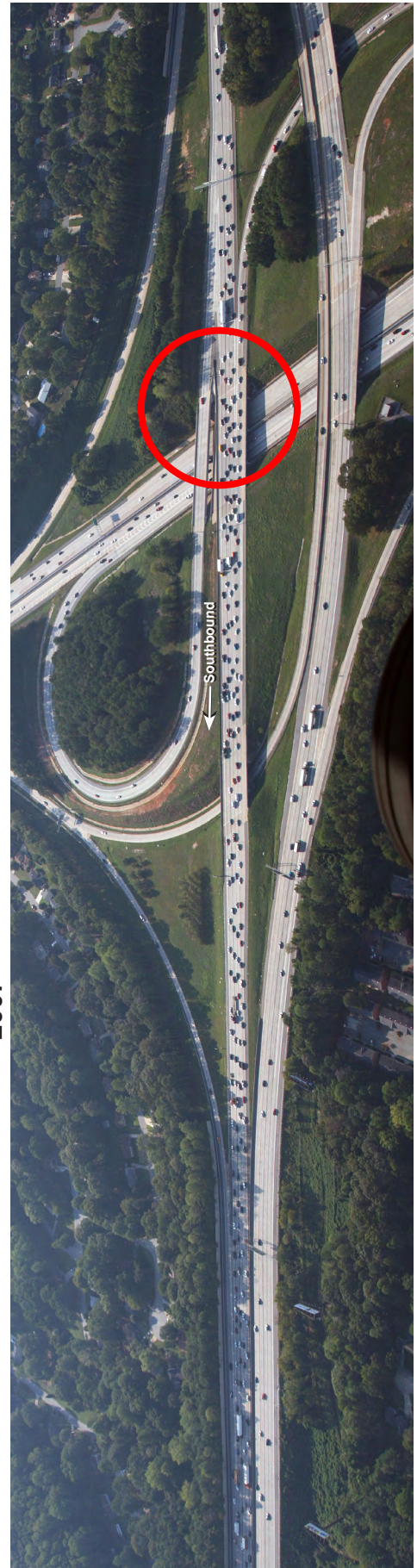
FREeway DEGRADATION: I-285 southbound approaching US 78 (Stone Mountain Freeway) in Dekalb County, Evening:

In 2005, southbound I-285 between I-85 and US 78 was identified as a freeway showing improvement (less severe congestion than in prior years); a project to add an extra travel lane approaching and on the US 78 exit ramp may have contributed to the improvement (see green circle). In 2007 this corridor generated delays similar to earlier years, except that the head of the congested zone consistently was found to be one segment farther downstream than before, between US 78 and Ponce de Leon Ave. This is visible in 2007 photo, in the form of higher traffic densities at the US 78 acceleration lane (see the red circle) and in the travel lanes downstream (to the left) from there.



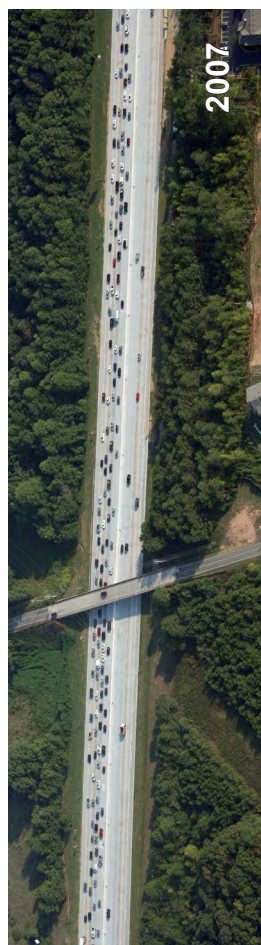
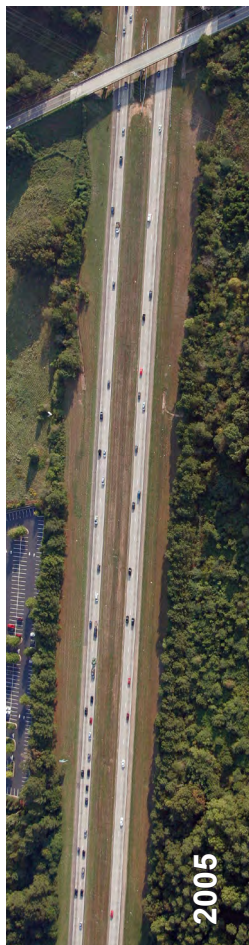
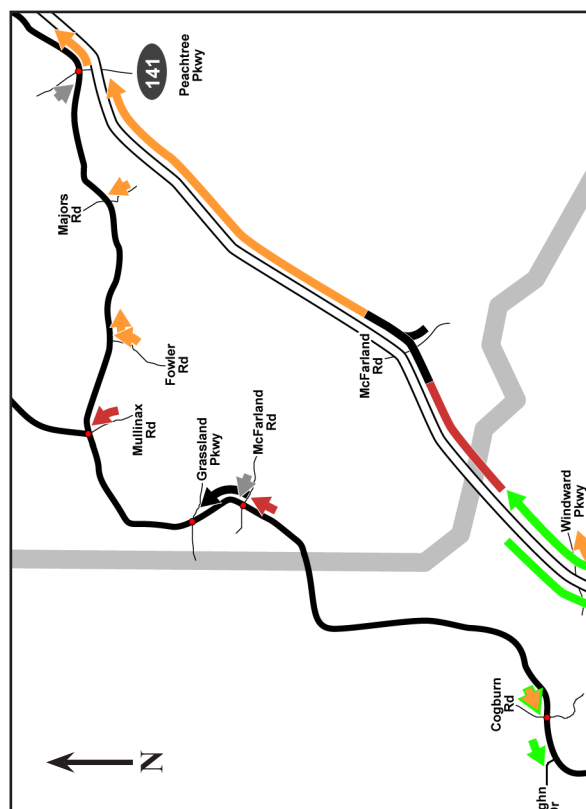
2005

2007



FREEWAY DEGRADATION: Northbound SR 400 approaching the end of the widened zone vicinity McFarland Rd in Forsyth County, Evening:

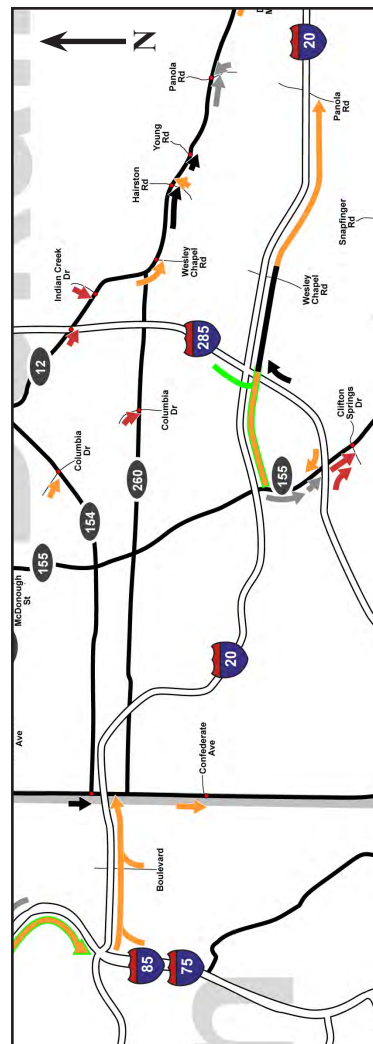
SR 400 was previously featured for dramatic congestion relief due to a 9-mile widening project in Fulton and Forsyth Counties. However, shifting of some delays were documented downstream, particularly for drivers approaching the end of the widened zone near McFarland Road.



(Above) : Degraded northbound conditions are shown in this set of photos of SR 400 just south of the interchange at McFarland Road. This is the northern limit of the widening project where traffic is now required to merge from four to two lanes.

FREEWAY DEGRADATION: Eastbound I-20 in Fulton and Dekalb Counties, Evening:

Signs of minor degradation were found in two locations on I-20, first for the three miles east of the I-75 / I-85 interchange (congested some days but not others), and east of Wesley Chapel Rd. These delays were not severe; however, they may prove to be indicative of long-term pattern shifts. (In 2005, exit queues to Wesley Chapel Rd caused by construction may have eased traffic downstream on I-20; still, the net effect appears to be greater overall congestion in 2007.)

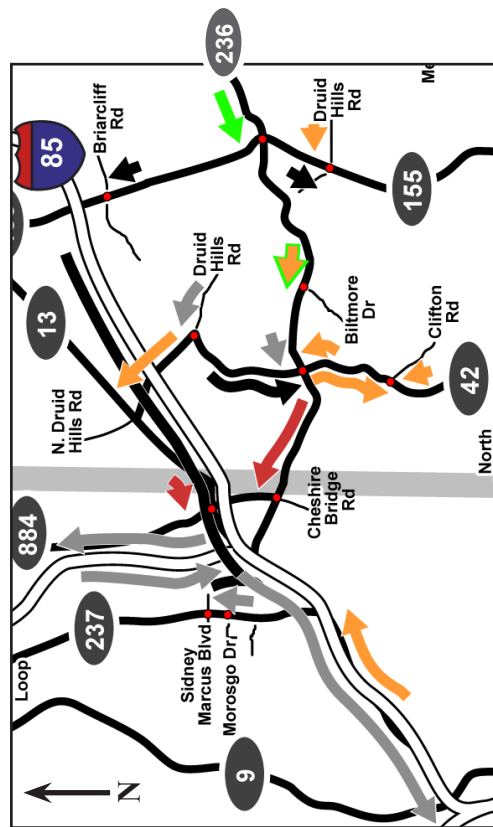


ARTERIAL DEGRADATION: SR 236 westbound at Cheshire Bridge Rd / Lenox Rd in Dekalb County, Morning:

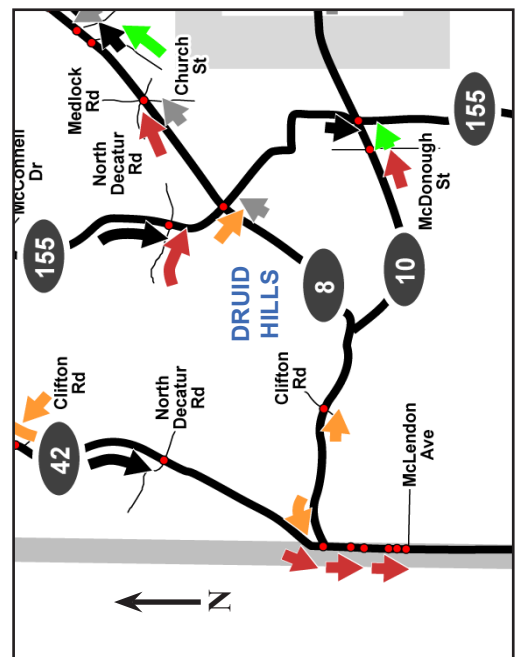
Improvements were mixed with degradations on the routes near I-85 in Dekalb County. A new one-lane queue was found on SR 236 (LaVista Rd) at Cheshire Bridge / Lenox Rd; factors influencing the change may include pavement striping changes associated with a new development adjacent to SR 236 (bottom of photo); or there may have been upstream signal timing changes that enabled SR 236 to deliver vehicles faster to this intersection (suggested by green arrows in graphic).



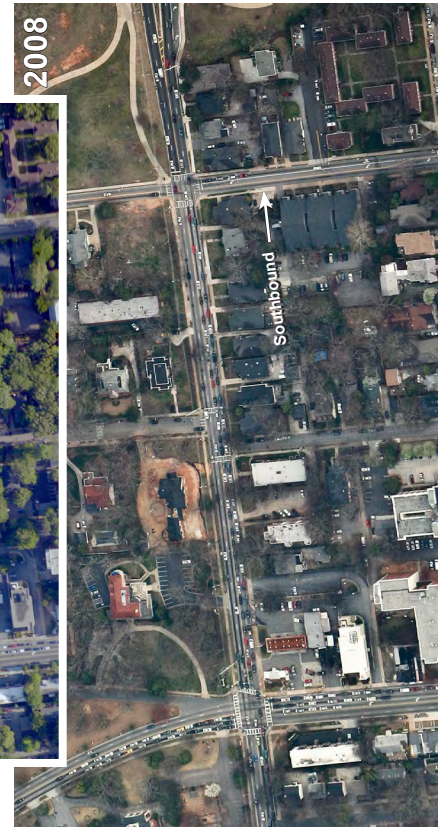
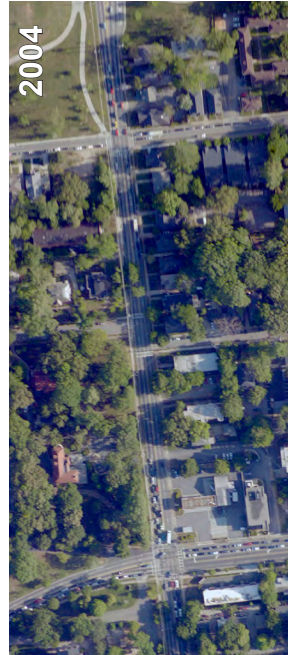
The head of a new queue on SR 236 at Lenox Rd.



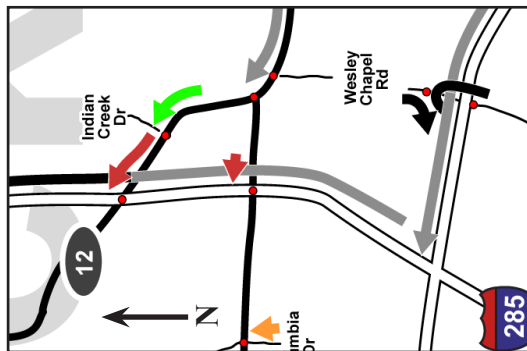
ARTERIAL DEGRADATION: Various sites vicinity Druid Hills & North Decatur in Dekalb County, Evening:



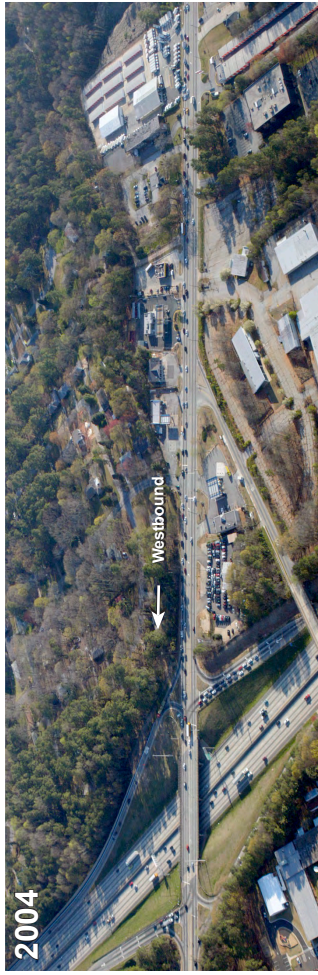
Additional locations where the cause of degradation is unconfirmed were found in the Druid Hills area; this photo (right) shows new southbound congestion on SR 42 (Moreland Ave) backing through the SR 8 (Ponce de Leon Ave) intersection. Downstream signals appeared to be the underlying cause (see left side of map).



ARTERIAL DEGRADATION: Westbound SR 12 at I-285 in DeKalb County, Morning:



Congestion was not new but apparently shifted downstream approaching I-285 on SR 12; it is possible that an unverified improvement at the signal at Indian Creek Dr allowed the bottleneck to move downstream.



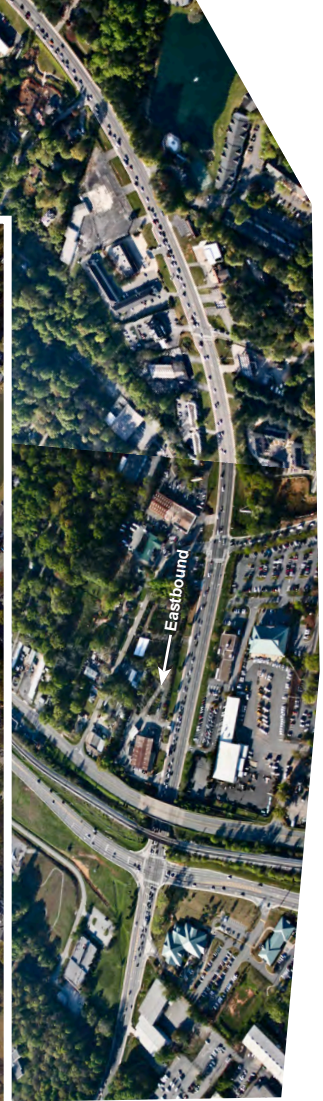
2008



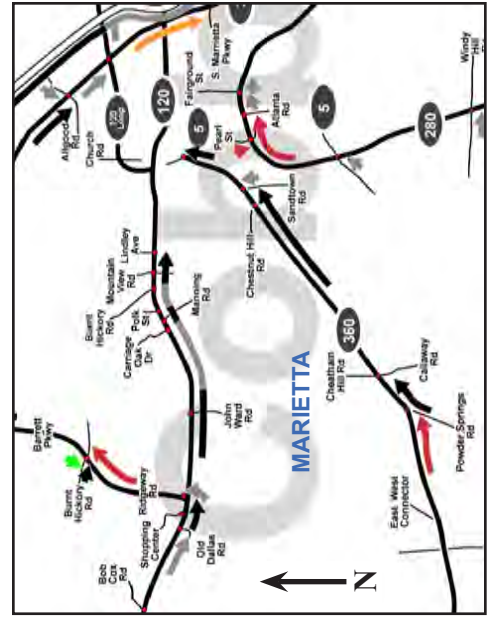
ARTERIAL DEGRADATION: Sites in Marietta (along Barrett Pkwy, SR 360 and SR 280) in Cobb County, Morning:



2008

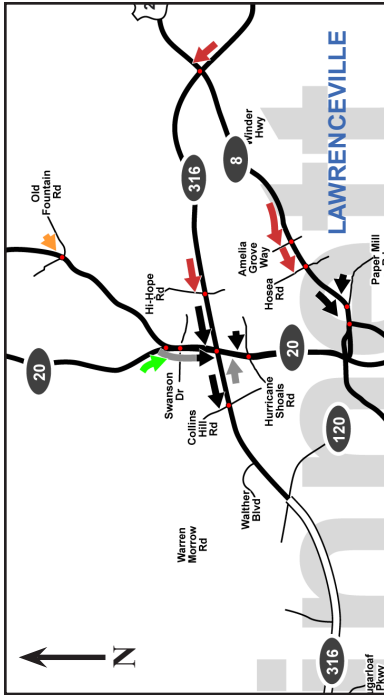


(Left, looking toward the south): Eastbound congestion on SR 280 approaching the signal at Atlanta Road is shown here. This was one of three sites in Marietta west of the I-75 corridor that recorded mobility degradation.



ARTERIAL DEGRADATION: Sites along westbound SR 316 and southbound SR 8 in Gwinnett County (Lawrenceville), Morning:

(Photo view is to the north): Westbound congestion approaching Hi-Hope Rd (intersection to the left) was not new in 2008; however, the queue now backed through the next upstream signal (Progress Center Ave, at the airport entrance). On a parallel route to the south, long one-lane queues were found in 2008 approaching the signals at Amelia Grove Way and Hosea Rd (not shown in photos).

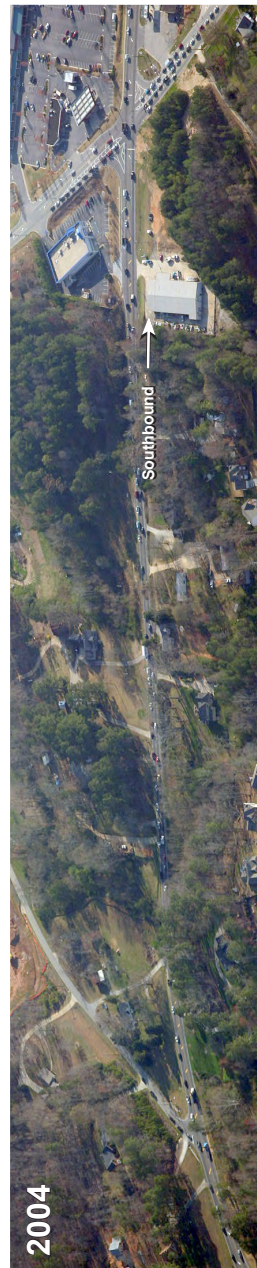


2008



ARTERIAL DEGRADATION: Southbound SR 20 at Suwanee Dam Rd in Gwinnett County (vic. Sugar Hill), Morning:

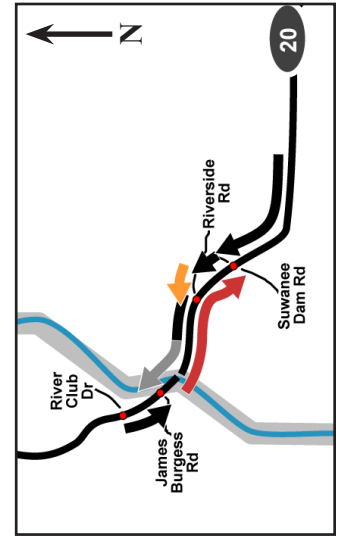
(Photo view is to the north): While severe westbound congestion was found on SR 20 in 2004, eastbound queues were shorter and delays were relatively minor. However, severe one-lane congestion was found in both directions during the 2008 survey flights.



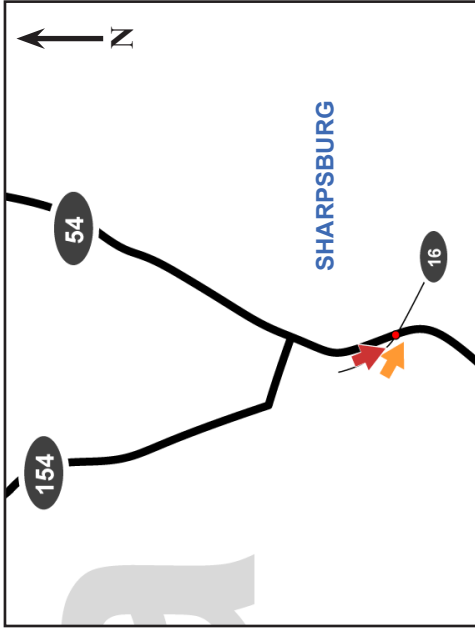
2004



2008

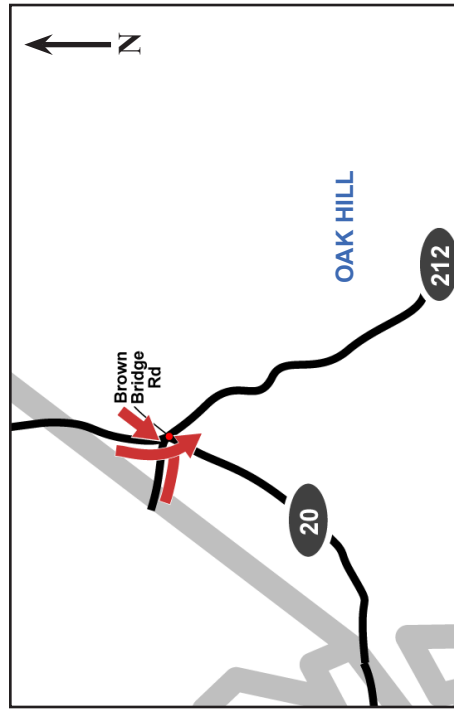


ARTERIAL DEGRADATION: Southbound SR 54 at SR 16 in Coweta County (vic. Sharpsburg), Evening:



Southbound congestion (from right to left in the photo) was found on SR 54 approaching the signal at SR 16. Other approaches were also intermittently congested as well, including SR 16 during the morning survey period.

ARTERIAL DEGRADATION: Southbound SR 20 at SR 212 in Newton County (vic. Oak Hill), Evening:

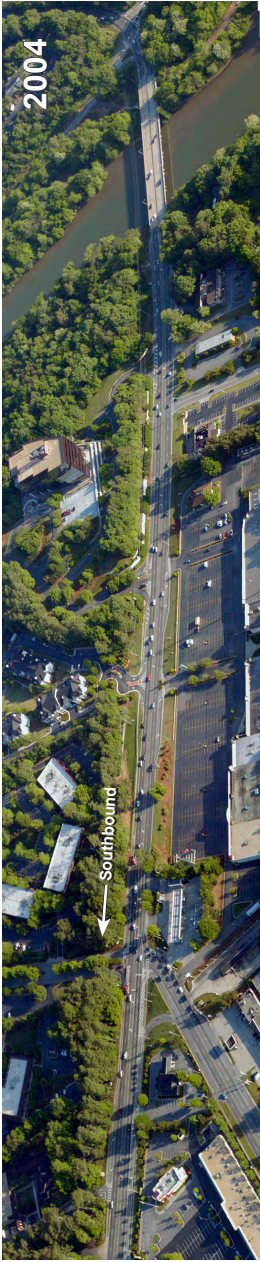


This rural intersection of five one-lane approaches generated congestion and delays on all approaches (sometimes all at once). This problem, only intermittently found in 2004, may have been exacerbated by an intersection improvement upstream at Cowan Road (described in Section 2.1).

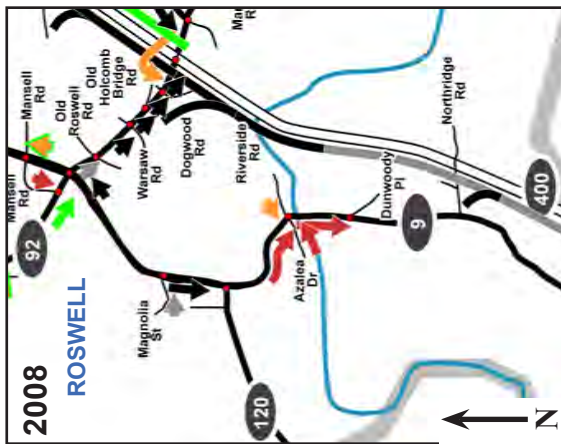


ARTERIAL DEGRADATION: SR 9 across the Chattahoochee River in Fulton County, Morning and Evening:

Morning



Despite improvements on SR 400 that appeared to have relieved pressure on SR 9 farther north through Alpharetta, the SR 9 crossing of the Chattahoochee generated delays more consistently than during the first (2004) survey. Reconstruction of the intersection at Dunwoody Place just to the south was just being completed at the time of the flights, which may have caused unusual demand patterns; another possibility for the morning period is that an interim signal timing algorithm for construction may not yet have been updated by the time of the 2008 survey flights.



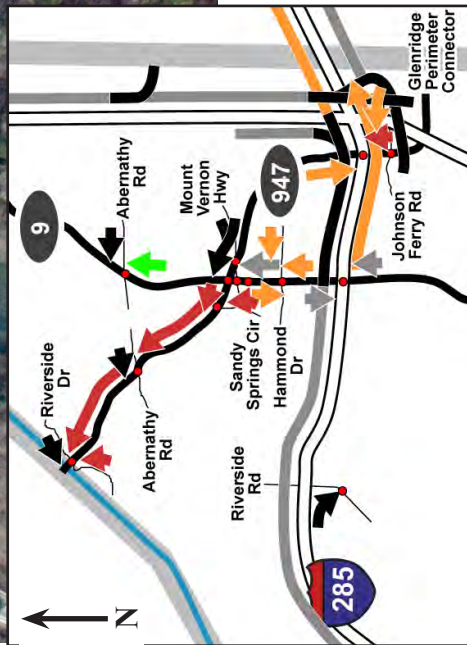
Evening



ARTERIAL DEGRADATION: Northbound SR 947 (Johnson Ferry Rd), in Fulton County, Evening:

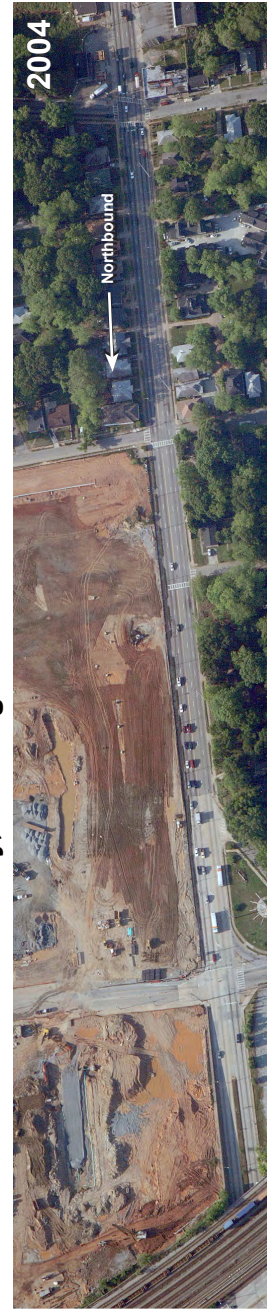
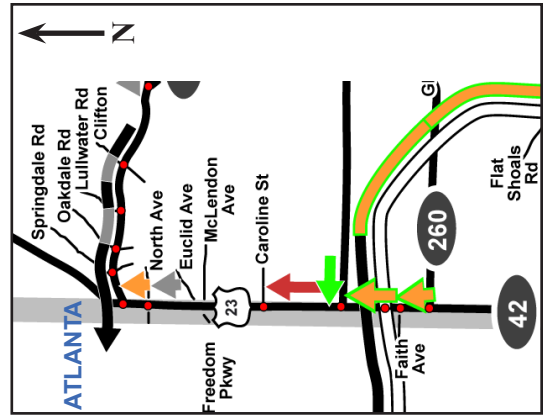


(Left and above): Northbound congestion on SR 947 (Johnson Ferry Rd) at Riverside Drive was not new in 2008; however, the tails were encountered farther upstream. During one flyover the queue extended back through the signal at Abernathy Rd.

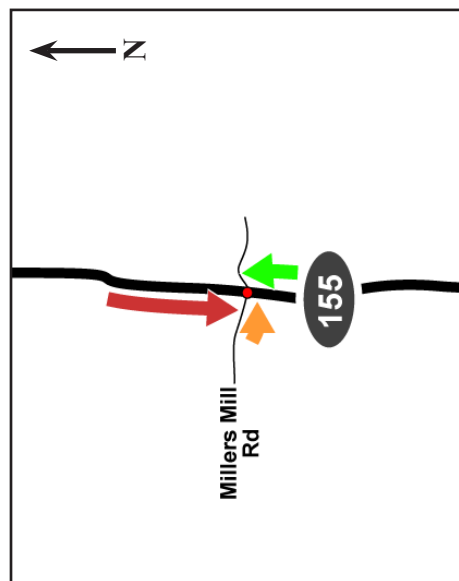


(Right and below): A new bottleneck was found on SR 42 (Moreland Ave) at Caroline St; it is possible that improved flow upstream (see green arrows) allowed congestion to re-form downstream.

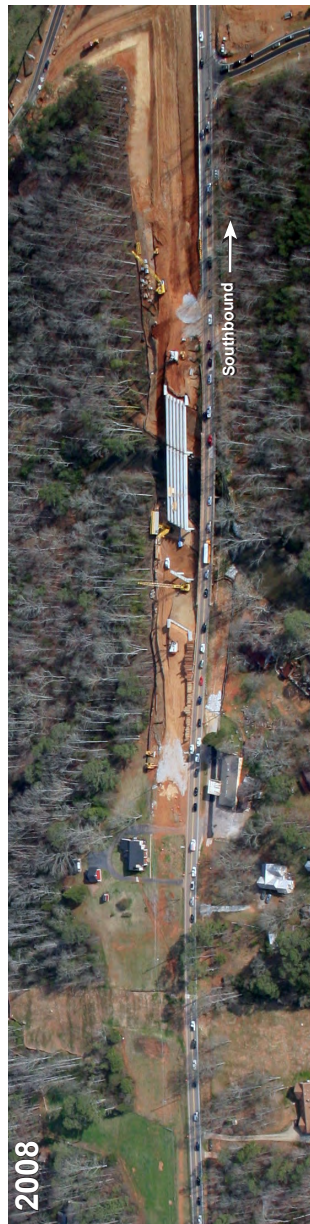
ARTERIAL DEGRADATION: Northbound SR 42 at Caroline St in Fulton Cnty, Morning:



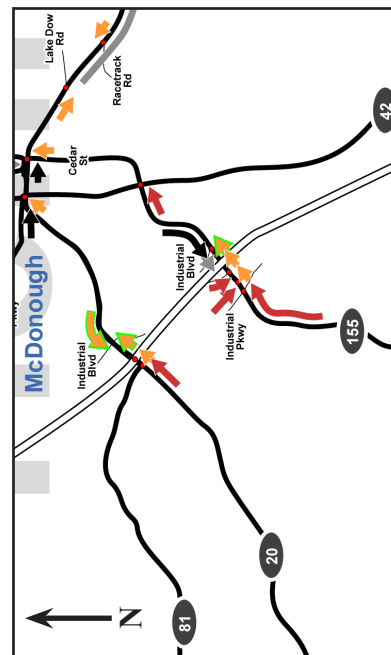
ARTERIAL DEGRADATION (CONSTRUCTION): SR 155 southbound at Millers Mill Rd in Henry County, EVENING:



New congestion was found where SR 155 was being widened (vicinity Millers Mill Rd). It was not clear if the construction was the only cause of this congestion.



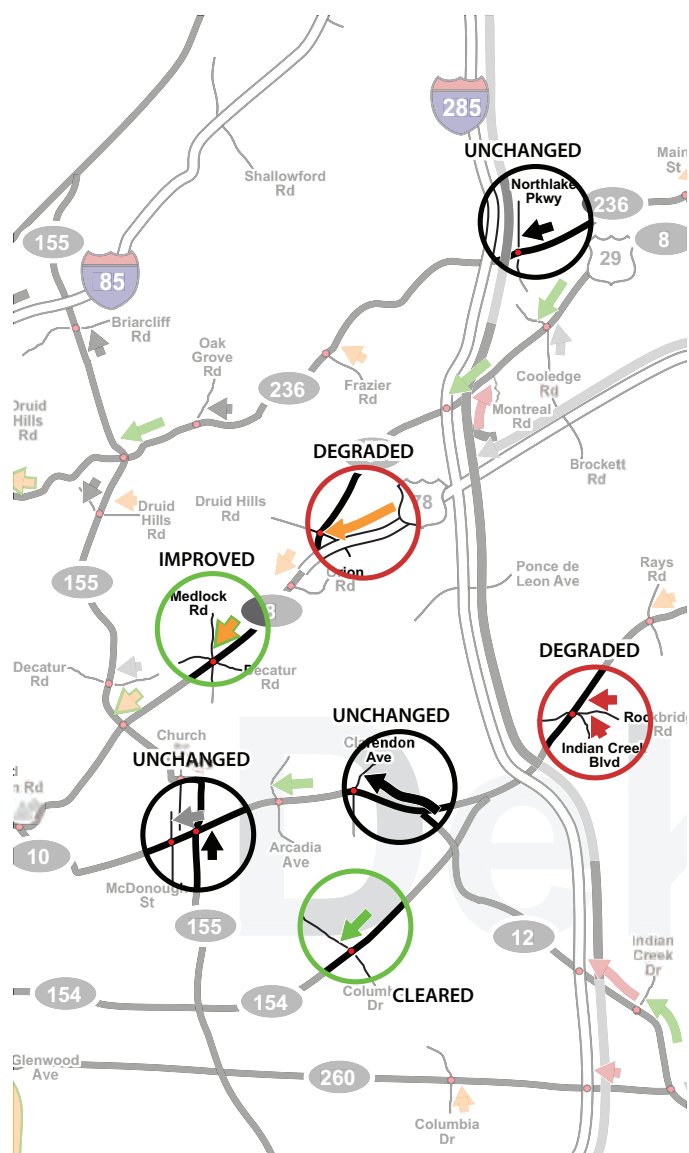
ARTERIAL DEGRADATION: Northbound SR 155 approaching I-75 in Henry County (McDonough), Evening:



(This photo is oriented looking southeast): Degraded mobility was found on SR 155 at the I-75 interchange outside of McDonough. The head of the queue appeared to be primarily at the signal at Industrial Parkway.



Sections 2.3 and 2.4: Comparative Arrowhead Maps (Morning and Evening)



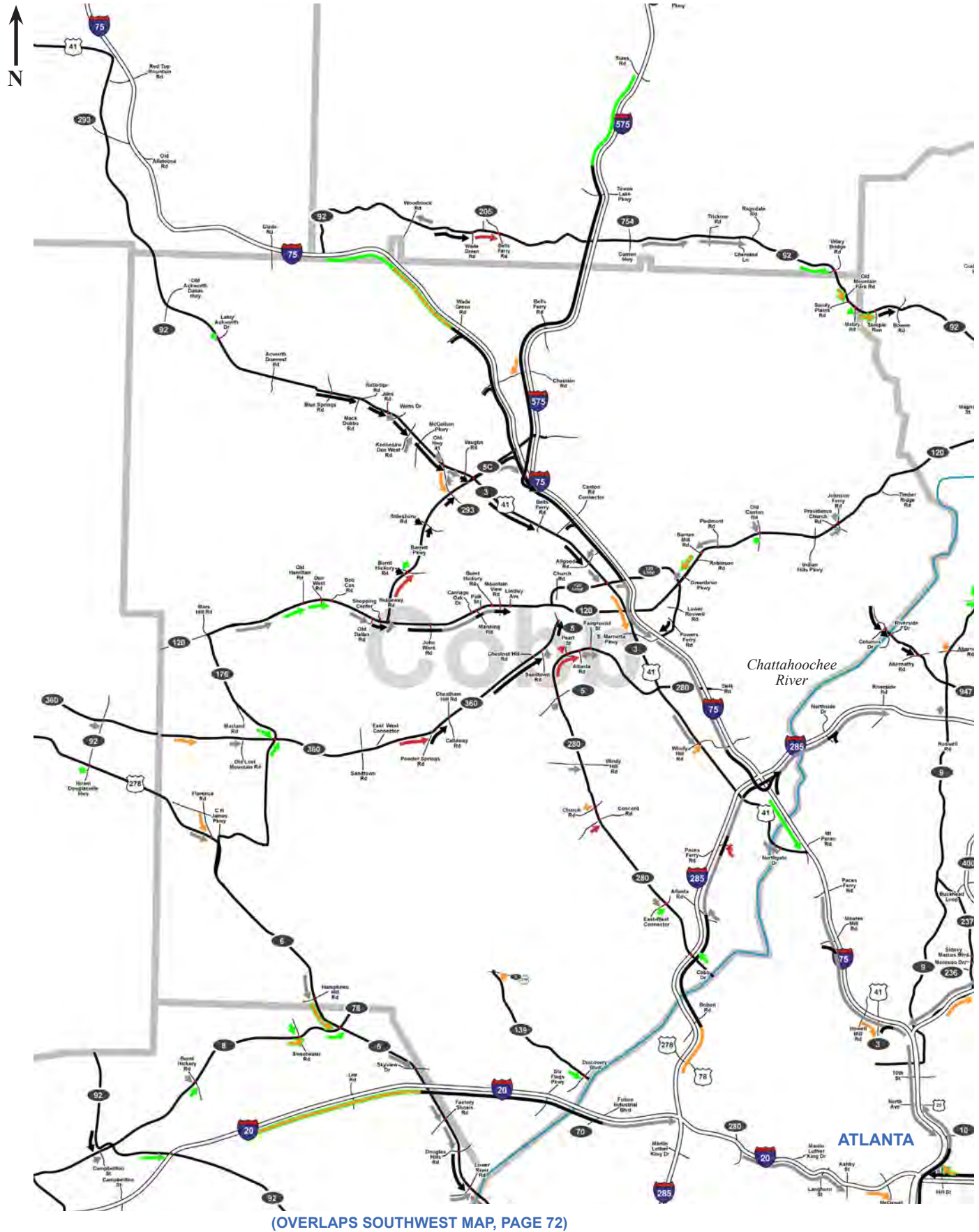
The next two sections present the complete set of morning and evening comparative arrowhead maps, as they appear at the Georgia DOT website (www.dot.ga.gov/statistics/trafficsurvey/). Please note that some of the outlying areas have been cut-off; those areas can be examined at the website.

As previously described, the bottleneck maps presented in Part One have been converted to "Comparative Maps" for Part Two. These maps have been modified to highlight exactly where significant changes have been found on the network, between 2004/05 and 2007/08. The comparative maps differ from the Part One bottleneck maps in that many red and orange arrows -- those that depict where congestion has NOT significantly changed -- have been switched to less prominent black and gray. Bright colors (red, orange and green) have been used to highlight ONLY where the significant changes were found:

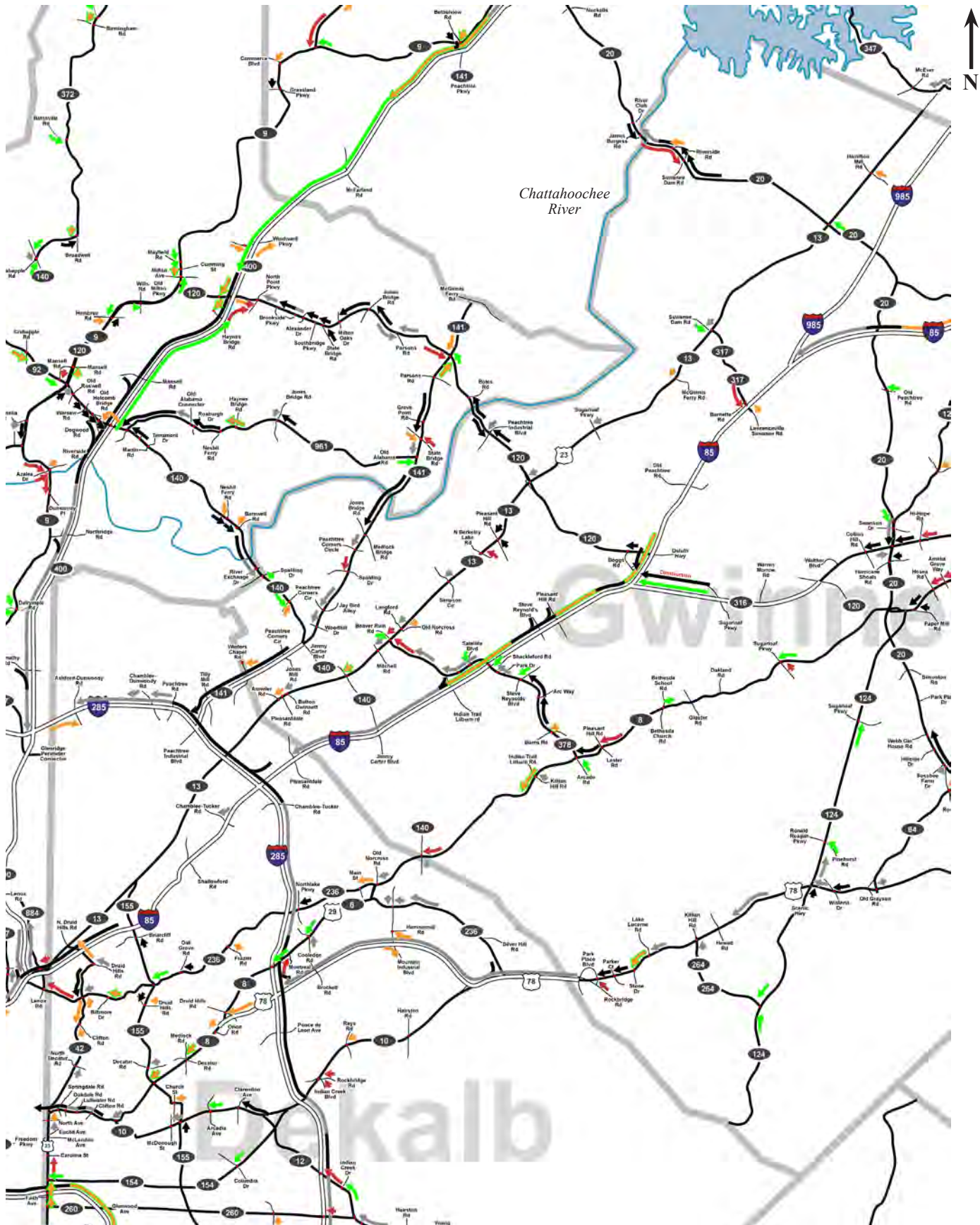
- 1) RED depicts severe congestion that was not necessarily new but significantly degraded;
- 2) ORANGE depicts minor or intermittent congestion that was not found previously.
- 3) GREEN arrows have been added to depict where previous congestion was no longer found.
- 4) Lastly, a special symbol was needed where previously-severe congestion was partially mitigated to less-severe levels; ORANGE arrows with GREEN BORDERS were used in these situations.

The map cut-out to the left has examples of all of these types of arrows.

NORTHWEST COMPARATIVE MAP (morning)

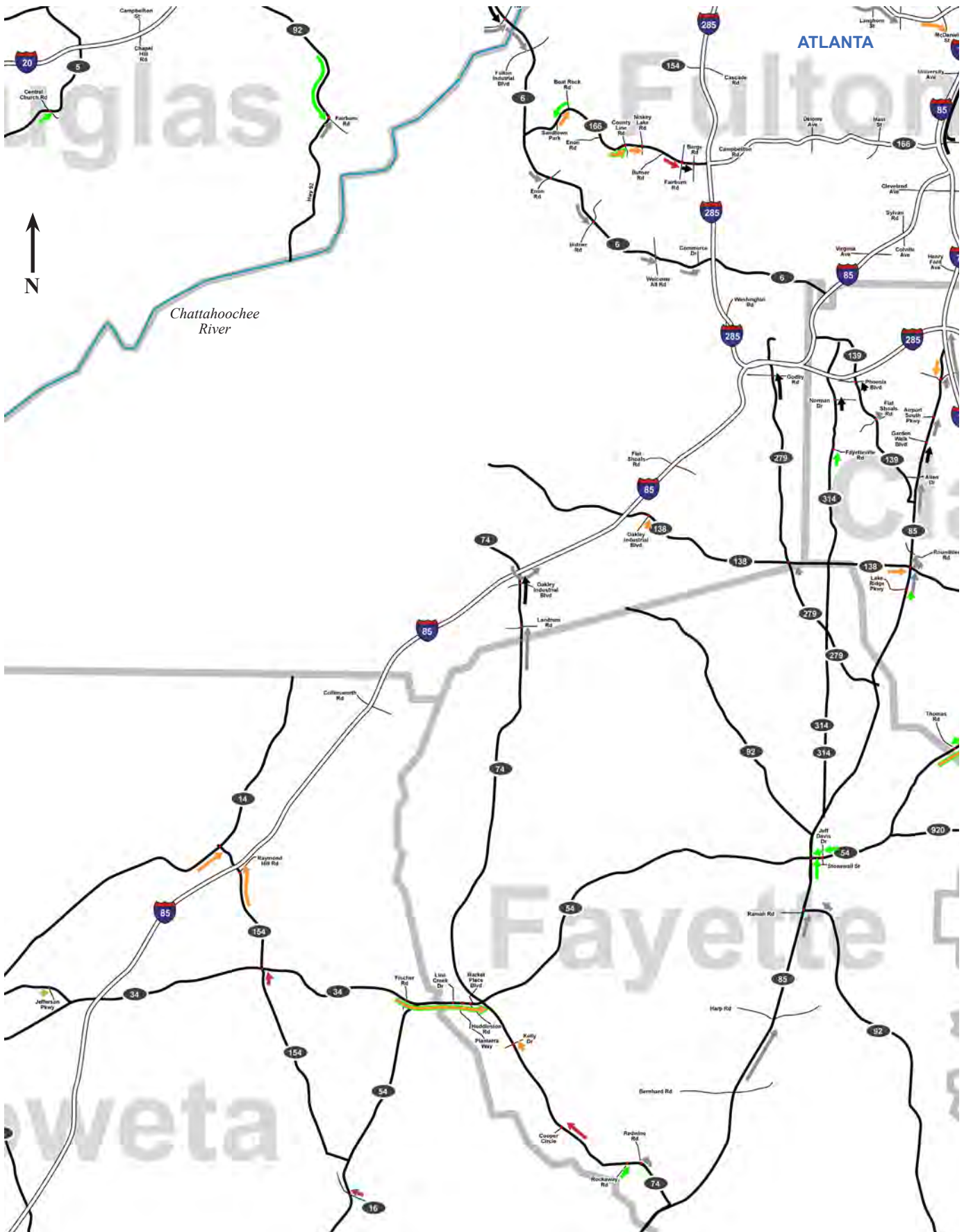


NORTHEAST COMPARATIVE MAP (morning)



(OVERLAPS SOUTHEAST MAP, PAGE 73)

SOUTHWEST COMPARATIVE MAP (morning)



SOUTHEAST COMPARATIVE MAP (morning)

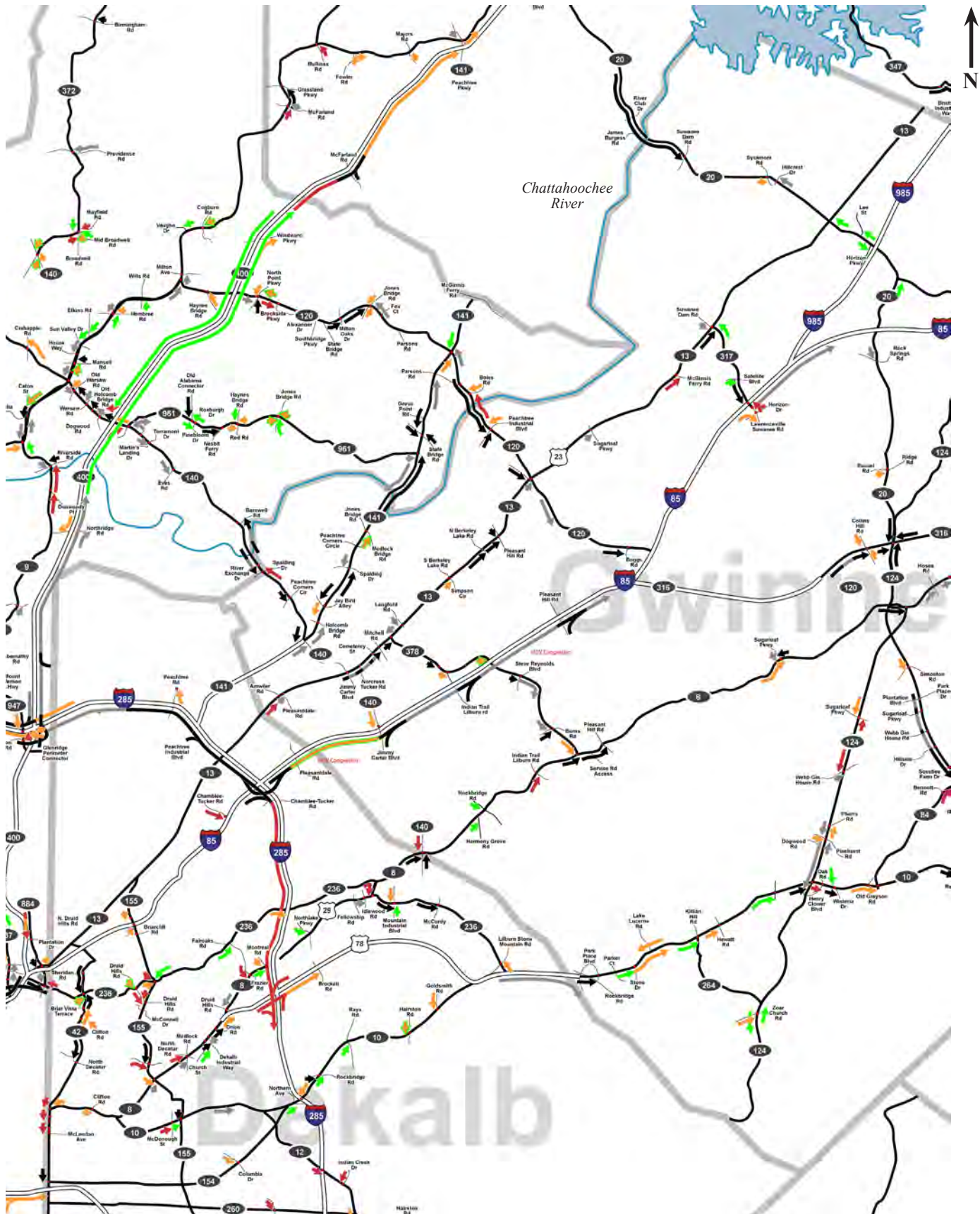


NORTHWEST COMPARATIVE MAP (evening)



(OVERLAPS SOUTHWEST MAP, PAGE 76)

NORTHEAST COMPARATIVE MAP (evening)



(OVERLAPS SOUTHEAST MAP, PAGE 77)



SOUTHEAST COMPARATIVE MAP (evening)

